Appendix I

List of persons and organisations who submitted evidence

NOTE: Oral as well as written evidence and information was given by those marked *. Those marked ** were in addition visited by the Committee.

A. Government Departments

Admiralty
Air Ministry *
Department of Technical Co-operation
Ministry of Aviation *
Ministry of Education *
Scottish Education Department *

B. Operators and employers of pilots

Air Navigation and Trading Company Ltd.
British European Airways Corporation *
British Independent Air Transport Association Ltd.*
British Overseas Airways Corporation *
British United Airways *
Business Aircraft Users Association Ltd.
Crop Culture (Aerial) Ltd.
Cumberland Aviation Services Ltd.
Eros Airline (U.K.) Ltd.
Executive Air Transport Ltd.
Fairey Air Surveys Ltd.
Loganair, Aviation Division
Mayflower Air Services
Mercury Airlines Ltd.

C. Organisations representing pilots

The British Air Line Pilots Association *
British Women Pilots' Association
The Guild of Air Pilots and Air Navigators *

D. Flying and training schools, etc.

Air Schools Ltd. (London School of Flying Ltd.) **
Airwork Services Training **
Avigation Ltd.*
Bedfordshire Air Centre Ltd.
British Executive Air Services Ltd.**
The College of Aeronautics *
The College of Air Training **
Exeter Airport Ltd.
The London School of Air Navigation Ltd.*
Marshall Flying Services Ltd.
Sir John Cass College **
Yorkshire Flying Services Ltd.

E. Educational organisations

Association of Teachers in Technical Institutions
Association of Technical Institutions
The Educational Institute of Scotland
The Headmasters Association of Scotland
London County Council

F. Other organisations and persons

Aeronautical Research Council
The Air League of The British Empire *
Air Registration Board *
Applied Psychology Research Unit of the Medical Research Council
Association of British Aero Clubs and Centres Ltd.*
Association of Municipal Corporations
British Aircraft Corporation Ltd. (Vickers-Armstrongs (Aircraft) Ltd.) * ø
Mr. V. H. Bellamy
British Owners and Pilots Association
Flight Lieutenant D. J. Diprose
The Flying Instructors, the College of Air Training
Mr. E. W. Havard
Squadron Leader F. Holt
Mr. J. O. S. Howter
Hunting Aircraft Ltd.
Flight Lieutenant J. F. Martin
Squadron Leader D. Orchard
Miss Adele Park
The Royal Aero Club *
The Royal Aeronautical Society
The Students' Committee, the College of Air Training *
Mr. H. Symonds
Mr. G. Taylor
Captain G. Thomas
Mr. A. W. Townsend
Mr. R. T. S. Vigers
Flight Lieutenant R. E. Wakeford
Mr. A. H. Yates

ø No written evidence received from this witness.

Appendix II

Professional licence examination results

1. Commercial Pilot's Licence written examinations *

(Note: Candidates must pass all papers in 3 attempts within 6 consecutive examinations, i.e. approximately 6 months)

Record of attempts of candidates passing in 1962 ⌀

Attempts	1	2	3	4	5	6	Total passes
Number of Candidates	152	94	45	7	1	1	300

2. Senior Commercial/Airline Transport Pilot's Licence written examinations *

(Note: Candidates must pass all papers in 3 attempts within a period of 18 months)

Record of attempts of candidates passing in 1962 ⌀

Attempts	1	2	3	4	5	Total passes
Number of Candidates	84	55	12	2	1	154

---

* The examinations conducted by the Air Registration Board in Airframes and Engines (General and Specific Type) and Performance are not included in these figures, but are dealt with separately in paragraph 5 of this Appendix.

⌀ The number of candidates passing includes some who commenced the examination in 1961; the number of new applicants and the overall numbers attending for examination in 1962 were:-

	New applicants	Actual numbers attending for examination
Commercial Pilot's Licence	367	757
Senior Commercial/ Airline Transport Pilot's Licence	231	484

3. The General Flying Test

In 1962 207 new applicants attempted the test, of whom 186 passed during the year.

Record of attempts of candidates passing in 1962

Attempts	1	2	3	4	Total passes
Number of Candidates	84	70	27	5	186

4. The Instrument Rating Flight Test

In 1962 361 candidates attempted the test, of whom 279 passed during the year.

Record of attempts of candidates passing in 1962

Attempts	1	2	3	4 or more	Total passes
Number of Candidates	59	79	47	94	279

5. Air Registration Board examinations

Record of attempts of new candidates for the Commercial Pilot's Licence passing the Airframes and Engines (General and Specific Type) and Performance examinations, between October - December 1962

Attempts	1	2	3	4	Total passes	Numbers attending for examination
General	53	11	4	1	69	96
Specific type	71	7	-	-	78	85
Performance					73	113

Appendix III

Establishments conducting courses of pilot training at present approved by the Ministry of Aviation

The Air Schools Organisation, (a) Denham Flying Club, Denham Aerodrome, Bucks. (b) The London School of Flying Ltd., The Aerodrome, Elstree, Herts. (c) The Midland School of Flying Ltd., Derby Airport, Burnaston, Derby.	Private Pilot's Licence
Airways Aero Club, White Waltham Airfield, Nr. Maidenhead, Berks.	Private Pilot's Licence
Airwork Services Training, Pertb (Sccne) Aerodrome.	Private Pilot's Licence Commercial Pilot's Licence Instrument Rating
Bedfordshire Air Centre Ltd., Cranfield, Bletchley, Bucks.	Private Pilot's Licence
Bournemouth Flying Club, Bournemouth (Hurn) Airport, Christchurch, Hants.	Private Pilot's Licence
Bristol & Wessex Aeroplane Club, Bristol (Lulsgate) Airport.	Private Pilot's Licence
British Executive Air Services Ltd., (a) Oxford Airport, Kidlington, Oxford. (b) Birmingham Air Centre, Elmdon Airport, Birmingham.	Private Pilot's Licence
College of Air Training, Hamble, Southampton, Hants.	Commercial Pilot's Licence Instrument Rating
Cumberland Flying Club, Silloth.	Private Pilot's Licence
Exeter School of Flying, The Airport, Exeter.	Private Pilot's Licence
Fair Oaks Aero Club, (Universal Flying Services Ltd.), Fair Oaks Aerodrome, Chobham, Surrey.	Private Pilot's Licence
The Hampshire Aeroplane Club, The Airport, Southampton, Hants.	Private Pilot's Licence

Herts and Essex Aero Club (1946) Ltd., Stapleford Airfield, Nr. Romford, Essex.	Private Pilot's Licence
Lancashire Aero Club, Barton Aerodrome, Eccles, Lancs.	Private Pilot's Licence
London Transport Flying Club, Fair Oaks Aerodrome, Chobham, Surrey.	Private Pilot's Licence
Luton Flying Club, Luton Airport, Bedfordshire.	Private Pilot's Licence
Marshall Flying Services Ltd., The Airport, Newmarket Road, Cambridge.	Private Pilot's Licence
Newcastle-upon-Tyne Aero Club, Municipal Airport, Newcastle-upon-Tyne.	Private Pilot's Licence
Northamptonshire Aero Club, Sywell Aerodrome, Northampton.	Private Pilot's Licence
Plymouth & District Aero Club, The Airport, Crownhill, Plymouth.	Private Pilot's Licence
Portsmouth Aero Club, City Airport, Portsmouth.	Private Pilot's Licence
Rochester Flying Club, (Universal Flying Services Ltd.), Rochester City Airport, Kent.	Private Pilot's Licence
Skegness Aero Club, Skegness Airport, Ingoldmells, Lincs.	Private Pilot's Licence
Southend-on-Sea Municipal Air Centre and Flying School, Municipal Airport, Southend-on-Sea.	Private Pilot's Licence
Southern Flying, Shoreham Airport, Sussex.	Private Pilot's Licence
Surrey & Kent Flying Club, Biggin Hill, Kent.	Private Pilot's Licence
Ulster Flying Club (1961) Ltd., Newtownards Aerodrome, Belfast, Northern Ireland.	Private Pilot's Licence
West London Aero Services Ltd., White Waltham Airfield, Maidenhead, Berks.	Private Pilot's Licence
The Wiltshire School of Flying Ltd., Thruxton Aerodrome, Andover, Hants.	Private Pilot's Licence
Yorkshire Flying Services Ltd., Leeds-Bradford Airport.	Private Pilot's Licence

Appendix IV

Pilot training establishments

School	Courses of flying and ground training	Approximate duration of courses	Approximate cost	Approximate numbers which could be accommodated on course	Approximate numbers trained each year	Entrance qualifications, selection (if any) for professional licence courses (excluding official medical)	Whether residential	Remarks
Airwork Services Training, Perth.	Private Pilot's Licence	1 month	£225			1. Sponsored students are accepted direct. 2. Non-sponsored students are asked for evidence of "O" level mathematics and English language or equivalent. An interview is also given wherever practicable. 3. All students are given a short examination in mathematics and English essay on arrival, or on interview.	Yes (Cost - £273 for 12 months' course)	1. Courses in aeronautical, electrical and instrument maintenance engineering, Air Traffic Control and for Operations Officers, are also offered. 2. Airwork Services Training is a member company of Airwork Services Ltd., a wholly owned subsidiary of Air Holdings Ltd., which also owns British United Airways. 3. Tuition in technical English etc. is also available for foreign students.
	Commercial Pilot's Licence	9 months	£1,395	100	80/100			
	Instrument Rating	2/3 months	£1,125					
	Airline Transport Pilot's Licence	13 weeks	£117	45				
	Instructor's Ratings	6 weeks	£180					
	Helicopter Private Pilot's Licence *	1 month	£475					
	Helicopter Commercial Pilot's Licence *	2 months	£1,099					
	* If fixed-wing licence held.							

School	Courses of flying and ground training	Approximate duration of courses	Approximate cost	Approximate numbers which could be accommodated in course	Approximate numbers trained each year	Entrance qualifications, selection (if any) for professional licence courses (excluding official medical)	Whether residential	Remarks
Avigation Ltd., Ealing Broadway, London, W.5.	Personal tuition and correspondence courses in written examination subjects for private and professional licences		Approx. £6 per week for personal tuition, £5 per week for postal courses				No	
British Executive Air Services, Oxford.	Private Pilot's Licence Commercial Pilot's Licence Instrument Rating Instructor's Ratings	1 month 9 months 3 months	) £2,600) (including) accommodation)	40	90 30 (including part-courses for C.P.L.)	Applicants for the scholarships mentioned under "Remarks" are required to have 3 "O" level passes in the G.C.E. and are interviewed after obtaining the Private Pilot's Licence before proceeding to the Commercial Licence course.	Accommodation available at Oxford Airport	British Executive Air Services was formed by a merger of the former Oxford Aviation Company Ltd. and the Air Services Division of the Pressed Steel Company Ltd., of which it is now a subsidiary. The School has in the past offered a limited number of non-repayable scholarships of £500.

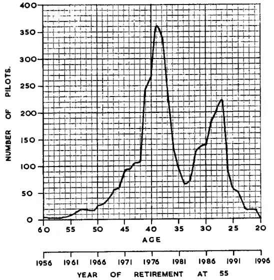
School	Courses of flying and ground training	Approximate duration of courses	Approximate cost	Approximate numbers which could be accommodated in course	Approximate numbers trained each year	Entrance qualifications, selection (if any) for professional licence courses (excluding official medical)	Whether residential	Remarks
The College of Air Training, Hamble.	Commercial Pilot's Licence * Instrument Rating * The course also includes:- 1. Instruction to the level required to pass the A.L.T.P. examination. 2. Vocational education in aero-sciences and mathematics. 3. Liberal Studies	) 2 years	£6,800 (£743 also payable for tuition and maintenance)	200	80	1. Five G.C.E. passes (or equivalent) including English language, mathematics and a science subject. Two passes must be at "A" level. 2. Attendance at College selection centre for interview, aptitude and personality tests, and practical flying tests. 3. Cadets sponsored by the Airways Corporations are required to pass a further medical examination.	Yes	
The London School of Air Navigation, Ltd., Knightsbridge, London, S.W.3.	Personal tuition and correspondence courses in written examination subjects for private and professional licences		6 gns. per week for personal tuition, varying fees from 18-44 gns. for postal courses				No	

School	Courses of flying and ground training	Approximate duration of courses	Approximate cost	Approximate numbers which could be accommodated in course	Approximate numbers trained each year	Entrance qualifications, selection (if any) for professional licence courses (excluding official medical)	Whether residential	Remarks
The London School of Flying, Elstree.	Private Pilot's Licence	3/5 weeks	£200	50	50	Candidates vetted as to their suitability for flying training by a selection board.	Accommodation can be arranged. Limited residential accommodation on aerodrome is planned.	The School is a fully owned subsidiary of Derby Airways. A limited number of students may be awarded internal scholarships of up to 1/3 of the cost of training. Students at the School receive priority for aircrew positions in the Derby Aviation and associated companies.
	Commercial Pilot's Licence	8 months	£1,425	40/45	23/30			
	Instrument Rating	3 months	£265					
	Instructor's Ratings	About 2 months	£230					
Sir John Cass College, Department of Navigation, London, E.C.3.	Direct tuition in written examination subjects for professional licences	Normally this does not exceed 3 months for the Commercial Pilot's Licence and 6 months for the Airline Transport Pilot's Licence	Fees Commercial Pilot's Licence - £8.5.0. Airline Transport Pilot's Licence - £16.5.0.	40	50/100		No	The College is grant aided by the London County Council. The civil aviation courses will be directly administered by the Council when they are transferred to the new College of Navigation which is to be erected at Tower Hill and should be available in 1966.

Note: Students from overseas are accepted at all of the above schools; at the College of Air Training they must be sponsored by the Government of their country or by one of their national airlines.

Appendix V

Professional pilots' age structure 1961



Appendix VI

List of main publications mentioned

Air Navigation Order 1960	(S.I.1960 No. 972)	H.M.S.O.:1960
Approved training and its application to training schools and establishments in the United Kingdom	(C.A.P.66)	H.M.S.O.:1954
Aviation Safety	(Cmnd 1695)	H.M.S.O.:1962
The Commercial, Senior Commercial and Airline Transport Pilot's Licences (Flying Machines) including the Instrument Rating and the Instructor's Rating	(C.A.P.54)	H.M.S.O.:1961
Industrial Training: Government Proposals	(Cmnd 1892)	H.M.S.O.:1962
Personnel Licensing, Annex 1 to the Convention on International Civil Aviation (Fifth Edition)		H.M.S.O.:1962
15 to 18. A report of the Central Advisory Council for Education (England) Vol. 1 (Report)		H.M.S.O.:1959 reprinted 1960
Report of the Committee on Recruitment, Training and Licensing of Personnel for Civil Aviation and Memorandum by the Minister of Civil Aviation	(Cmnd 7746)	H.M.S.O.:1949
Statistics of Education, 1962. Part One.		H.M.S.O.:1963

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PART I

INTRODUCTION

Chapter 1 - Procedure

1. Our appointment by the Minister of Aviation was announced on 30th July, 1962, with the following terms of reference:-

> "To inquire into:
>
> (a) recruitment and selection of professional pilots for civil aviation, and
>
> (b) facilities and standards for their flying training and education;
>
> and to make recommendations."

2. Beginning on 31st October, 1962, we have met on twenty-four occasions.

3. We invited a number of organisations and Government Departments to submit comments, and a general invitation to give evidence was issued through the press. We did not find it necessary to ask all who submitted written evidence to supplement it by oral evidence. In all we took oral evidence from representatives of twenty-four organisations and bodies, and written evidence was received from sixty-eight witnesses. Our written and oral evidence was supplemented by visits to five organisations carrying out courses of training for professional pilots. The Chairman, accompanied by Mr. J. R. Neill, Assessor, visited the United States of America in October, 1962, for discussions with the Federal Aviation Agency, who also kindly arranged a tour of some representative American pilot training facilities. A list of those who gave evidence and organisations visited is in Appendix I.

4. We have also read with interest correspondence and articles in the aeronautical press which have been related to aspects of our inquiry.

Chapter 2 - Developments since the Wilcock Report

5. We have noted the conclusions and recommendations of the Committee on Recruitment, Training and Licensing of Personnel for Civil Aviation, whose report, with an accompanying Memorandum by the Minister of Civil Aviation, was published in 1949 (Cmnd 7746). This Committee is generally referred to as the Wilcock Committee.

6. One of the Wilcock Committee's conclusions was that unless State aid was given to the training of new civil pilots recruited from outside the Services, a serious shortage of trained pilots would develop in a few years' time. In his memorandum on the Committee's report, the Minister of Civil Aviation accepted that the fullest use should be made of ex-Service pilots for employment in civil aviation and he subsequently set up a standing committee consisting of representatives of the Ministry of Civil Aviation, the Service Ministries and the employers of pilots, to provide a continuous review of the supply of pilots. This Committee, the Standing Joint Committee on Recruitment to Civil Aviation from the Services, still functions and is dealt with in more detail subsequently.

7. After a detailed examination, the Minister of Civil Aviation concluded that the figures in the Wilcock Committee's estimates for the future requirements of pilots were too high, that it was by no means certain that a shortage of pilots was imminent and that although the supply of pilots would be kept under close review, the Government could not accept without further examination that there was a case for the expenditure of public funds on the training of entrants from civil life.

8. The Air League of the British Empire, the Airways Corporations, the independent operators and bodies representing pilots, submitted a memorandum to the Minister of Transport and Civil Aviation in May, 1954, saying that the supply of ex-Service pilots was no longer satisfactory as the main source of recruitment for civil aviation because of the uncertainties concerning the numbers available and the quality of the candidates coming forward. It was recommended that the special needs of civil aviation should be met by a scheme of selection, recruitment and training, jointly administered by the Government, operators and interested organisations, and financed by Government scholarships. In a debate in the House of Commons in February, 1955, the Joint Parliamentary Secretary said that following a detailed review by an interdepartmental committee, the Government, despite forecasts to the contrary, considered that there should be a supply of ex-Service pilots, sufficient to meet the needs of civil aviation, for at least the next seven or eight years. He also said that the Government could not contemplate heavy public expenditure on pilot training schemes, although the air transport industry was quite free to set up its own individual or co-operative schemes of training.

9. The White Paper "Aviation Safety" (Cmnd 1695) presented to Parliament by the Minister of Aviation in April, 1962, pointed to the

reduction in the number of recruits from the Services in recent years, and mentioned the correspondingly increased importance of facilities and standards for the selection and training of pilots at civil flying schools. The White Paper confirmed the Government's willingness, already demonstrated by its contribution to the College of Air Training, set up in 1960, to meet a share of the expense of training suitably selected students attending other approved courses. At the same time it put forward a framework of measures, within which the Government considered a suitable pattern of professional pilot training could be worked out.

10. We have interpreted "professional pilots" in the light of the Standards and Recommended Practices contained in Annex 1 to the Convention on International Civil Aviation, as meaning those pilots flying for remuneration and requiring one of the three professional licences - the Commercial Pilot's Licence, the Senior Commercial Pilot's Licence or the Airline Transport Pilot's Licence. The White Paper "Aviation Safety" announced that the Minister of Aviation intended to bring United Kingdom practice into line with these international standards and recommended practices, by requiring pilots flying for remuneration for test purposes and on executive aircraft to hold professional licences. Flying instructors working for remuneration also require professional licences (except in the circumstances described in paragraph 28).

11. An account of the system of examinations, licences, ratings and checks for professional pilots is given in Chapter 4, but we did not consider our terms of reference required a detailed critical examination of the system. We understand that there is continuing consultation between the Ministry of Aviation and all interested parties on licensing matters and in general we would not wish to trespass on a field already covered by established machinery. However, where we feel licensing and examination matters have a direct bearing or influence on the training and education of pilots we have considered it appropriate to comment.

12. Our terms of reference involve the consideration of an important part of the arrangements, described in the White Paper "Aviation Safety", proposed to secure the safety of United Kingdom civil aviation. Throughout our inquiry we have borne in mind that although many bodies and persons carry varying degrees of responsibility for aviation safety, a heavy burden of individual responsibility rests on the pilots of aircraft, particularly their commanders. Because civil aviation is an industry of rapid, if somewhat uneven, change, future training arrangements must be flexible to enable British operators to maintain their efficiency and competitiveness in world aviation. Sound instruction and training for pilots will be essential in the future if they are to keep pace with the growing complexities of aircraft and equipment.

13. Civil aviation is an international industry. Safety standards and practices, including those for the licensing of pilots, have to meet the needs of the United Kingdom and in addition must conform to the international requirements agreed under the Convention on International Civil Aviation. Not only has the United Kingdom undertaken to implement the international requirements, but the freedom of United Kingdom pilots to fly in foreign states may be dependent on our application of suitable standards. British professional licences and pilot training facilities are well regarded overseas, and later we take into account the demand from overseas students for places in training establishments in the United Kingdom. We have also thought it necessary to acquaint ourselves with arrangements overseas for training pilots in order to compare their systems with our own.

14. We have examined arrangements for general and vocational education for other occupations in the United Kingdom. We have also commented on a number of matters, such as career prospects, seniority and promotion, which in our view influence selection, recruitment and training, but which we fully appreciate are primarily matters for the commercial management of airlines and the established machinery for industrial consultation.

PART II

PRESENT ARRANGEMENTS

Chapter 4 - Professional licences

15. The Air Navigation Order 1960, requires pilots of public transport aircraft to hold professional licences issued by the Minister of Aviation. The White Paper "Aviation Safety" announced the Minister's intention to extend this requirement to pilots employed to fly executive aircraft, and to test pilots, so that effectively all pilots flying for remuneration will in future be required to hold professional licences. Not only must a pilot hold the appropriate licence, but the public transport operator, in addition to conducting statutory tests, must satisfy himself that the pilot is in every way competent to perform his duties and use the equipment provided. The Ministry exercises close oversight over the manner in which operators discharge their statutory obligations, through the system of Air Operator's Certificates. The roles of the Ministry and the operator are therefore to a large extent complementary; in effect, the licence sets a minimum standard of general proficiency and knowledge, while the special skill and knowledge in respect of particular aircraft and operations are dealt with in the main by the operator.

16. There are three professional licences defined in Annex 1 to the Convention on International Civil Aviation, the Commercial, the Senior Commercial, and the Airline Transport Pilot's Licences. Endorsed on their licences professional pilots must have an aircraft rating to show the particular type (or types) that they are competent to fly, and in practice they also need an Instrument Rating certifying that they are competent to fly on instruments under Instrument Flight Rules. There are also ratings for the purposes of giving instruction (which may also be held by holders of private licences) and which are described in greater detail in paragraphs 27-32.*

17. Before being granted a licence or rating a pilot must satisfy the Minister that he "is a fit and proper person to hold the licence and is qualified by reason of his knowledge, experience, competence, skill and physical fitness to act in the capacity to which the licence relates and for that purpose the applicant shall furnish such evidence and undergo such examinations and tests ... as the Minister may require of him" (Air Navigation Order 1960, Article 16). Applicants are required to produce evidence of experience, and have to pass the appropriate ground examinations and flying tests specified for the licences in question. Examinations and tests

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* Details of the examinations and tests for all private and professional licences and instructor's ratings are published by Her Majesty's Stationery Office in pamphlets in the "Civil Aviation Publications" series (C.A.P.). Details of these pamphlets are included in the list of publications mentioned in this report, in Appendix VI.

for professional licences and the Instrument Rating are conducted by Ministry and Air Registration Board examiners. In the case of private licences and other ratings, flight testing is mostly done by experienced pilots who, while not employed in the Ministry, have been specially authorised to conduct tests.

The Commercial Pilot's Licence

18. This is the lowest grade of professional licence. It entitles the holder to act as pilot-in-command of public transport aircraft below 12,500 lbs. all-up weight, or as co-pilot of aircraft of any weight. The types of aircraft which may be flown are recorded on the licence when the pilot has been tested for his competence on the particular type. To qualify for the grant of a Commercial Pilot's Licence the pilot must have 200 hours experience as a pilot, or 150 hours if he has completed a course of instruction which the Ministry has approved. He must also pass Ministry of Aviation examinations which cover an elementary knowledge of:-

Aviation Law, Flight Rules and Procedures
Flight Planning
Flight Navigation
Meteorology
Radiotelephony
Signals
Seamanship (if the licence is to include a sea or amphibian class of flying machine);

and the Air Registration Board examinations in:-

Airframes and Engines (General)
Airframes and Engines (Specific Type)
Performance

The examinations in these subjects are designed to test a basic knowledge to the minimum standard consistent with the pilot-in-command privileges inherent in the licence, i.e. to fly small aircraft over relatively short distances.

19. The flight test which the pilot must undergo for the grant of a Commercial Pilot's Licence consists of general flying tests covering:-

Cross Country Flying
Basic Aircraft Handling
Instrument Flying
Night Flying

In addition to these basic flying tests, conducted by Ministry of Aviation examiners, a pilot is given a test of his competence on the particular type on which he wants to qualify, either as pilot-in-command or as co-pilot. These tests are normally conducted by check pilots who are employed by the aircraft operators and approved by the Ministry to act as type-rating examiners.

The Senior Commercial Pilot's Licence

20. This licence was originally designed to be a stepping stone between the Commercial Pilot's Licence and the Airline Transport Pilot's Licence. It entitles a pilot to act as pilot-in-command of commercial aircraft below 30,000 lbs. all-up weight, or as co-pilot of aircraft of any weight. As in the case of the Commercial Pilot's Licence, the types of aircraft which the pilot is entitled to fly are endorsed on the licence when he has passed the appropriate tests on the particular type. To qualify for a Senior Commercial Pilot's Licence a pilot must have 700 hours flying experience including at least 200 hours as pilot-in-command. He must also pass the Ministry's written examinations, but he is not required to undergo again the flying tests which he underwent for the Commercial Pilot's Licence.

21. The written tests for the Senior Commercial Pilot's Licence cover a wider field and a higher standard of navigational knowledge than is required for the Commercial Pilot's Licence and are designed to test the basic knowledge necessary for a pilot who is to fly large aircraft over long distances. They consist of written papers and oral tests in:-

Navigation (General)
Navigation (Radio Aids)
Navigation (Instruments)
Navigation (Plotting)
Navigation (Flight Planning)
Meteorology (Paper 1)
Meteorology (Paper 2)
Aviation Law Flight Rules and Procedures
Signals
Navigation Instruments (Oral)
Radiotelephony
Seamanship (if the licence is to include a sea or amphibian class of flying machine)
Airframes and Engines (General)
Airframes and Engines (Specific Type)
Performance

The papers do not require the pilot to have a comprehensive theoretical knowledge in any aspect and are a mixture of elementary theory and practical applications. An applicant for a Senior Commercial Pilot's Licence is also required to undergo an Instrument Rating Flight Test, if he does not already possess an Instrument Rating.

The Airline Transport Pilot's Licence

22. This is the most senior of the three professional pilot's licences and its possession entitles a pilot to fly an aircraft of any weight provided he

has passed the necessary type-rating tests. To qualify for the licence a pilot must have 1200 hours flying experience of which 250 hours must be as pilot-in-command. The standard of knowledge in navigation, meteorology, airframes and engines, etc., for the grant of this licence is the same as for the Senior Commercial Pilot's Licence. Hence the applicant does not have any written tests provided he has previously qualified for a Senior Commercial Pilot's Licence. It is not a requirement in the United Kingdom that a pilot must first obtain a Commercial Pilot's Licence before proceeding to the senior licences. Provided he has the necessary flying experience (for example through flying in the Services) and passes the appropriate written and other tests, he may qualify for an Airline Transport Pilot's Licence directly.

The Instrument Rating

23. To qualify for the rating the pilot must undertake an Instrument Rating Flight Test. Written tests of navigation, meteorology and flight rules and procedures are covered in the written examination which the pilot must pass to obtain a Commercial Pilot's or higher class of licence. The flight test for the initial grant of this rating is conducted by Ministry examiners. Competence in instrument flight must be maintained if the rating is to remain valid and this is checked in a renewal flight test at intervals of not more than 13 months. This rating is mandatory for any pilot who intends to fly an aircraft under Instrument Flight Rules in controlled airspace. The holder of a Commercial Pilot's Licence may voluntarily obtain the rating but for the issue of senior licences its possession is essential.

24. Renewal of Instrument Ratings is normally effected as a result of tests conducted by authorised examiners. These examiners are usually experienced company training and check pilots whom the Minister has so authorised.

Examination and test results

25. Summarised figures which give some indication of the standard of knowledge and competency of candidates coming before Ministry and Air Registration Board examiners are given in Appendix II.

Exchange of licences

26. As indicated in paragraph 13 the pattern of pilot licensing in the United Kingdom follows the Standards and Recommended Practices laid down in Annex 1 to the Convention on International Civil Aviation. Broadly, the United Kingdom policy is to grant a Commercial Pilot's Licence, which permits the holder to act as pilot-in-command of small aircraft and co-pilot in any aircraft, in exchange for any professional licence issued by a country which subscribes to the Convention; this licence is issued subject to the applicant passing an examination on Aviation Law, Flight Rules and Procedures, and examinations and flying tests appropriate to the particular ratings he wishes to obtain.

Flying Instructors

27. In view of the important role played by the flying instructor in pilot training, we include in this account of professional pilot licence qualifications a description of the machinery for issuing flying instructors with their ratings. Since April, 1932, the Guild of Air Pilots and Air Navigators, on behalf of the Minister, has examined, and made recommendations on, pilots applying for flying instructor's ratings.

28. The regulations require that any person giving flying instruction for the purpose of obtaining a licence, must hold an instructor's rating, and if payment is made, the instructor must also hold one of the three professional licences. Where however an instructor, pupil and aircraft belong to the same organisation - for example, a bona fide flying club or group - instruction may be given for payment without the instructor possessing a professional licence. There are two instructor's ratings - the Assistant Flying Instructor's Rating and the full Flying Instructor's Rating.

The Assistant Flying Instructor's Rating

29. The requirements for the issue of an Assistant Flying Instructor's Rating call for a minimum of 150 hours flying as pilot-in-command, a current private or professional pilot's licence, and proof of having completed a prescribed flying instructor's course within a period of six months, conducted by an instructor approved by the Guild. An assistant instructor may only instruct under the supervision of a full flying instructor and he undergoes an annual renewal examination. Further approved courses are required if he wishes to extend the privileges of his rating - for example to enable him to instruct on multi-engined aircraft.

Approved flying instructor's courses

30. In order to obtain the Guild's approval to give a flying instructor's course, a qualified instructor must possess a current professional pilot's licence, a minimum of 500 hours of instructional flying, a current instructor's rating, and must satisfy the Guild's Panel of Examiners in an actual flight and ground test.

The full Flying Instructor's Rating

31. When an assistant instructor has carried out a minimum of 400 hours as pilot-in-command, 200 of which are instructional flying, and has been instructing for at least six months, he may apply to the Guild to be up-graded to the full Flying Instructor's Rating. He is then required to take a flying and ground test, and if he passes will be recommended to the Ministry for upgrading.

The Panel of Examiners

32. The examinations and tests outlined above are administered by a panel of about twelve examiners, comprising some of the most experienced flying

instructors in the country. Vacancies on the panel are filled by inviting instructors for interview by a small committee usually consisting of the panel's Chairman, Vice-Chairman, one other member and a Ministry of Aviation representative. Before an instructor is appointed to the panel, the committee must be satisfied that he is of high integrity and responsibility and that he has a considerable amount of instructing experience. Following a satisfactory interview the candidate undergoes a flight and ground test with one or more of the panel members. The minimum qualifications which are looked for in a panel examiner are a Commercial Pilot's Licence and Instrument Rating, and also a reasonably long career in professional instruction, with an emphasis on basic instruction. For the convenience of candidates, the geographical location of examiners is taken into account so that they are based more or less evenly throughout the United Kingdom. In all its work the Guild's Panel of Examiners works very closely with the appropriate Ministry of Aviation safety and licensing branches.

Chapter 5 - Selection and recruitment

Types of employment

33. Having gained the appropriate licence and ratings a pilot may be employed for remuneration by an airline operator or other organisation. Usually the pilot will have the junior licence of Commercial Pilot, with an Instrument Rating, and be eligible for employment as a co-pilot on a public transport aircraft. As his experience grows and progressively reaches the appropriate qualifying levels for the Senior Commercial and Airline Transport Pilot's Licences, he will probably wish to extend the range of his flying privileges by further study leading to the ground examinations for these licences.

34. Although most professional pilots are employed in transport flying with airlines, others may be engaged on executive flying, aerial work such as crop-spraying, test flying or instruction. The following is an extract from estimates prepared by the Standing Joint Committee on Recruitment to Civil Aviation from the Services, as the result of a survey at 1st January, 1963. The numbers relate to pilots employed by operators based in the United Kingdom:-

Employed full time on public transport:		
British Overseas Airways Corporation	1,020	
British European Airways Corporation	872	
British United Airways	423	
Others	426	
		2,741
Employed full time on survey		22
" " " " agriculture		23
" " " " test		61
" " " " instruction		112
" " " " business aircraft		65
		3,024

35. The above figures show that the majority of professional pilots in the United Kingdom are engaged on public transport operations. The recently announced intention to require all test and paid executive pilots to hold professional licences will cause some increase in the numbers employed outside the airlines but it is unlikely to alter the pattern radically. For the long term, if general and executive aviation in this country develops on the lines already experienced in the United States of America, the figures for executive pilots could become more substantial.

Selection and recruitment

36. The recruitment of professional pilots in sufficient numbers has always been primarily a matter for the commercial judgment of airline operators and other employers of pilots. In the past employers have generally preferred to recruit qualified pilots, and although individual operators may have set levels

of selection for their employees they have not been obliged to take account of how and where basic training and experience have been obtained. An employer would tend to look for the following qualities and abilities in his pilots: equability of temperament; concentration or single-mindedness; "patterned thinking" together with quick responses to deviations from the normal or expected; the ability to decide quickly on "new behaviour patterns"; physical and mental fitness; administrative ability; acceptability in a personal capacity so that they can mix freely and attain the necessary stature for command; and, of course, the necessary natural ability as airmen. It is important to remember that there is no proved correlation between the desirable qualities and abilities of a pilot and his academic attainments.

37. The statements of Government policy since the war on the recruitment of pilots for civil aviation have, until the recent White Paper "Aviation Safety", encouraged operators to look mainly to the Services for a supply of trained and experienced pilots. In the special circumstances obtaining just after the war and subsequently as a result of the Services' aircrew recruitment schemes, this policy was natural and sensible. It ensured the fullest utilisation of the expensively-trained ex-Service pilots, who now constitute the bulk of our present senior professional pilots, and without whom the rapid post-war growth of British civil aviation would have been impossible.

38. Two organised schemes of selection and recruitment for professional civil pilots exist at present; these are at the College of Air Training, Hamble, where students are sponsored by the Airways Corporations with financial assistance from the Ministry of Aviation, and at Airwork Services Training, Perth, where some of the students are selected and sponsored by British United Airways. So far, all the students at the College of Air Training have been sponsored by the Airways Corporations, who say that they will look to the College in future as their main source of recruitment. The Airways Corporations and British United Airways employ about 2,300 out of the 3,000 professionally licensed pilots employed by operators based in the United Kingdom. The remaining 700 are employed by about fifty smaller operators who rely at present almost entirely on recruiting pilots who are already trained.

The Standing Joint Committee on Recruitment to Civil Aviation from the Services

39. Following the Report of the Wilcock Committee in 1949, this Committee was set up by the Minister of Civil Aviation to provide a continuous review of the supply of professional pilots for civil aviation. Under the auspices of the Ministry of Aviation, which provides the Chairman and Secretariat, the Standing Joint Committee meets twice a year to exchange information about the numbers of civil pilots employed and needed, and produces forward estimates of requirements for two years ahead. The Airways Corporations, the independent operators, the Air Ministry and the Admiralty are represented on this Committee.

Careers information

40. A feature of recruitment to other fields of industry and to the Services is the wide diversity of recruitment publicity and information, mainly directed at young people about to choose their future careers. We found that the College of Air Training, Airwork Services Training, and other civil flying schools, produce prospectuses and brochures and advertise their courses through the press. In addition, the College of Air Training has taken steps to bring its course to the attention of secondary schools and technical colleges. The Ministry of Aviation receives about 400 written enquiries a year about the opportunities available and the licensing and training requirements for careers in civil aviation. Although it is not primarily a function of the Ministry to do this, its policy is to provide information and guidance on such matters as licensing requirements for pilots, existing training schools, general prospects and conditions of employment in civil aviation and suitable publications for further reading. The Central Youth Employment Executive is preparing a new and comprehensive booklet on careers in civil aviation for publication in its "Choice of Careers" series.

41. There are in existence a number of training establishments - flying schools, private clubs and groups, and specialised schools for instruction in ground examination subjects. In accordance with the recommended practices of the Convention on International Civil Aviation, candidates trained at courses approved by the Ministry of Aviation are permitted to qualify with a reduced number of hours flying experience. As well as prestige value, approval has considerable economic value therefore, because flying is expensive; an applicant for a Private Pilot's Licence is permitted to qualify in 30 hours flying instead of 40 if he has followed an approved course, while for a Commercial Pilot's Licence 150 hours flying on an approved course is accepted instead of the 200 hours otherwise required. The Ministry of Aviation publishes requirements for the approval of Private and Commercial Pilot's Licence courses (C.A.P. 66). Many training schools and clubs are members of the Association of British Aero Clubs and Centres, which has produced "Pilotage Standards" accepted currently by the Ministry of Aviation as the minimum standard for the content of an approved course. A list of pilot training establishments at present offering approved Private and Commercial Pilot's Licence courses is in Appendix III. The list shows that only two establishments - the College of Air Training, Hamble, and Airwork Services Training, Perth - have qualified for approval for professional pilot training. Other establishments offer courses for professional pilots at which candidates may be trained; alternatively, over a period, they may pick up their training and flying experience at any school or club, at home or overseas.

42. Apart from the College of Air Training, Hamble, and Airwork Services Training, Perth, which both enjoy Ministry approval, some other schools aspire to approved school status; prominent among these we noted the London School of Flying, Elstree, and British Executive Air Services, Oxford. A considerable amount of tuition, in ground examination subjects only, is also undertaken by the Sir John Cass College Department of Navigation, Avigation Ltd., and the London School of Air Navigation Ltd., all of which are situated in London. The College of Air Training and Sir John Cass College are non profit-making educational institutions; the remaining schools are privately-owned commercial undertakings. A table giving comparative data about these schools is in Appendix IV. A fuller description of the College of Air Training follows.

The College of Air Training

43. As indicated in the White Paper "Aviation Safety", there has been a considerable fall in the numbers of experienced pilots coming forward from the Services in recent years. With this in mind the Government and the Airways Corporations decided to establish the College of Air Training to take young men leaving school and university and prepare them specifically to be civil airline pilots.

44. The College was opened in September, 1960. It is founded as a Trust

of which the two Airways Corporations and the Minister of Aviation are sponsors, with a Board of Governors - three nominated by each sponsor, one by the British Independent Air Transport Association, plus assessors from the Ministry of Education and the Scottish Education Department. The Corporations and the Government share the running costs of the College. The considerable capital cost of setting up the College has been entirely met by the Corporations. The College is open to nominees from all British, Commonwealth and foreign airlines but so far all the students have been sponsored by the Corporations. One Commonwealth student has been sponsored by British Overseas Airways Corporation.

45. The stated aims of the College are "to give the cadet over a period of two years, a comprehensive course of basic and advanced flying, together with the necessary technical and academic training to fit him in all respects for a career as an airline pilot, initially as a junior officer and subsequently as a Captain of aircraft". During the two-year course the cadet obtains the qualifications of a Commercial Pilot's Licence with Instrument Rating and Radio Telephony Licence, but by the conclusion of the course his technical knowledge is in advance of the standard required for the Airline Transport Pilot's Licence. In addition to flying, simulated flight training and technical training, the course includes vocational and general educational subjects related to the future career of the cadets.

46. A feature of the College is its selection and admission standards. Candidates on entry are required to be between 18 and 24 years of age and in possession of a General Certificate of Education with a minimum of five passes, including a pass in English language, Mathematics and a Science subject; two of the five passes must be at Advanced level. Equivalent qualifications are accepted. Graduates or undergraduates are not necessarily required to have the same G.C.E. qualifications as applicants straight from school and such applications are treated on their merits. Candidates are also required to pass the Ministry of Aviation medical examination for professional pilots and must also satisfy the sponsoring airline's medical authorities that they are likely to maintain this standard.

47. The College has a full-time selection organisation, which has been developed from the Royal Air Force aircrew selection machinery. Applicants with the required academic and medical standards must attend the College for preliminary interview and tests, followed by a period of residential selection for further tests of aptitude, intelligence and personality; finally there is a flying acceptance check, in which up to ten hours dual instruction on Chipmunk aircraft is given, in order to satisfy the College's experienced flying instructors that they have an aptitude for flying. The table below shows the rejection rates at the various stages in the College's selection process for entry in 1962/63:-

Total inquiries	2,227
Number of candidates attending preliminary interview	473
Number passing preliminary interview	315
Number of candidates attending residential selection	301
Number of candidates passing residential selection	141
Number of candidates failing Ministry of Aviation medical	7
Number of candidates failing Corporation medical	12
Number of candidates attending flying acceptance course	119
Number of candidates passing flying acceptance course	106
Number of candidates failing to obtain Advanced levels	31
Finally accepted	72

Notes

1. The above figures also include wastage due to withdrawals at various stages of the procedure.
2. 16 successful candidates from the 1961/62 selection process were available and with the 72 finally accepted above, made up the required number for entry in the year 1962/63.

48. So far, in the first two years, the wastage rate in training, including wastage for medical, personal and disciplinary reasons, has been about 1 in 5.

49. The gross cost of training each cadet is at present £6,800 for the two years' course, although costs vary with the number under training. These costs are met by a fixed grant of £1,000 per cadet from the Ministry of Aviation (who also contributed about £500 per cadet towards the initial heavy additional costs in the first two years), and the remainder by the sponsoring

airline. In the first two years of the College's operations, that is until September, 1962, the Ministry of Aviation contribution amounted to £226,000. Cadets are required to pay for tuition and maintenance during the course. The Ministry of Education has recommended to local education authorities that awards to cadets should be based on payment of tuition fees and maintenance now amounting to £70 and £365 per annum respectively, less any parental or student contribution. In arriving at the recommended maintenance grant, the Ministry has had regard to the length of the course and to recent changes in the rates of grant for university and comparable awards.

50. The College is residential, with recreational amenities, and facilities for a wide range of sports. The present establishment of instructional staff, aircraft and domestic accommodation is sufficient for an intake of 88 cadets each year. Arrangements could be made to provide for a higher intake, if required.

Chapter 7 - Selection, recruitment and training in the Royal Air Force

51. The Royal Air Force (with the Royal Navy) has the longest and most extensive experience of selecting, recruiting and training pilots in this country.

52. The Air Ministry has now ended the former system of Short-Service Commissions and bases its recruitment of pilots on Supplementary List Permanent Commissions entailing a normal career up to the age of 38, or 16 years' service (with the strong possibility of continued service to age 55), and on the General List entry, recruited mainly from the Royal Air Force College at Cranwell or direct from university, offering a normal career up to the age of 55. A minority of the Supplementary List entrants have options to leave after 8 and 12 years' service. The educational requirements for entry to the Supplementary List are five passes in the General Certificate of Education at Ordinary level of which two must be mathematics and English. The educational requirements for entry to the Royal Air Force College and to the General List is either a university degree or two Advanced level passes in the General Certificate of Education.

Presentation to the public

53. The Royal Air Force brings a flying career in the Service to the attention of schoolboys, undergraduates and parents. Some of the methods used to do this include close liaison with schools, visits by officers who show films and give talks, and invitations to headmasters, careers masters and parties of boys to visit Royal Air Force units. The Air Training Corps and Air Sections of the Combined Cadet Forces train boys along Royal Air Force lines, stimulate interest in the Service and offer flying scholarships and awards enabling boys to fly to Private Pilot's Licence standard. Royal Air Force Scholarships in the form of the payment of school fees are awarded to boys over 16 who undertake to enter the Royal Air Force College for a permanent career in the Force. There is also a pre-selection scheme whereby boys who are interested may, without commitment, attend the Officers and Aircrew Selection Centre, Biggin Hill, before they are old enough to qualify for entry, in order to take the medical and aptitude tests. All these schemes are backed by an extensive advertising campaign, aimed mainly at parents and school-leavers, and the distribution of large quantities of brochures and pamphlets.

54. A special feature of Royal Air Force recruitment is the deliberate effort made to attract and recruit university graduates. The main method of doing this is through the University Air Squadrons, in which undergraduates can learn to fly, go to camps in the vacation and learn something about the Force. Recruits from the University Air Squadrons are usually of a high standard and their training wastage rate is much lower than the average. We noted that the "Memorandum to Accompany Air Estimates 1963-64" included in "Statement on Defence 1963" (Cmnd. 1936), reported that in the past year the 17 University Air Squadrons provided 53 entrants

to the General Duties Branch and 24 entrants to the Ground Branches. The Memorandum continued that because the Royal Air Force wanted even more graduates, a new University Cadetship Scheme would operate shortly, whereby selected young men who had found places at a university and who undertook to follow a full career in the General Duties or the Technical Branches, would go to university as commissioned officers.

Selection and training

55. All aircrew candidates undergo medical and aptitude tests and assessments of personal and officer qualities; with the exception of applicants for cadetships to the Royal Air Force Colleges at Cranwell or Henlow, who go to the R.A.F. Selection Board for the assessment of their personal and officer qualities, these are carried out at the Officers and Aircrew Selection Centre, Biggin Hill. After entry, the training of Royal Air Force pilots is undertaken in four phases - initial service training which lays the foundation of professional capability of cadets as potential junior officers; next, basic flying and ground training on jet aircraft; then advanced flying training according to the role the pilot is to fill - bombers, transport aircraft, fighters, helicopters, etc. and finally, operational conversion training which adapts new pilots to the actual aircraft they are to use on operational missions with their squadrons.

Chapter 8 - Selection, recruitment and training of professional pilots overseas

56. We have already described how, under the Convention on International Civil Aviation, this country and all other major civil aviation countries (except the U.S.S.R. and Communist China) have undertaken to observe certain common standards and practices for the issue of licences and ratings to professional pilots. We decided that a detailed inquiry into the methods of civil pilot recruitment and training practised abroad was outside our strict terms of reference, but we studied such general information as was readily available, to see whether there was any general pattern of training arrangements abroad which might guide us in our inquiry. As described later in paragraphs 59-63 we were able to gather some first-hand information on professional pilot training in the United States of America.

Europe

57. The information available to us indicated that while training practices and arrangements in European states such as France, Germany, Holland, Italy and Switzerland differ in detail, there appears to be general acceptance of the concept that a comprehensive course of organised training is the best method of producing pilots who are suitably qualified to take their place in the major airlines. We noted that courses of training which receive State aid are geared to the requirements of the national flag carriers, which in some cases run the training establishments, and in others assist their governments in the control and administration of courses. There is evidence that most of the European states about whose arrangements we had information consider it important to ensure that a strong operational flavour is maintained in the training environment and curricula. For example, we noted that in one case students fly with the airline as part of their training while in another all the flying instructors fly regularly on the airline as co-pilots.

58. Apart from the training of pilots for the flag carrier, there do not appear to be any comprehensive schemes for the training of pilots for independent and executive operators. Few European countries, however, have independent public transport operators on the scale of the United Kingdom.

United States of America

59. In October, 1962, the Duke of Hamilton and Mr. J. R. Neill visited the Federal Aviation Agency, Washington, and a cross-section of operators, to find out at first hand how the training of the professional pilot is accomplished in the United States.

60. The Federal Aviation Agency does not control, or give direct aid to, any establishment engaged in the training of pilots for commercial aviation, but it lays down detailed standards which must be satisfied before any training establishment is classified as "approved". There is no obligation on an aspirant for a professional licence to attend such establishments but,

as in the United Kingdom, such attendance is to his advantage in that less flying time is needed to qualify for a Commercial Pilot's Licence. Pupils at approved courses are not required to receive integrated ground and air training and, in practice, some courses are approved for ground training only, while others are approved for flight training. In general, the Federal Aviation Agency is inclined to favour a system under which a keen young man can, by his own efforts, acquire the necessary experience and knowledge to enable him to pass the appropriate examinations and flight tests. It was explained that while hundreds of organisations have been given approval, they should not be regarded as schools. The training function is normally an adjunct to an aircraft sales agency or may form part of the activities of a firm engaged in crop spraying, air taxi and other miscellaneous charter activities.

61. For some years there has been an abundant source of supply from military service but this source is now drying up. The introduction of large aircraft and a recent pause in the expansion of the industry has created a situation where there is still a substantial surplus of pilots. There are about 20,000 airline pilots in the United States. The age structure of the airline pilot population is such that a large percentage will reach retirement age in 12 to 15 years' time.

62. Among the organisations visited were Purdue University, Lafayette, Indiana; Gopher Aviation, Rochester, Minnesota; North Central Airlines, Minneapolis; North West Airlines and United Airlines. Purdue University offers education mainly in applied science but, in addition, it offers a course of training for professional pilots. Entrants to this course are required to possess a Commercial Pilot's Licence and therefore, to some extent, the course represents advanced training. The course is unusual in that aeronautical engineering studies are integrated with actual short-haul commercial operations using D.C.3 aircraft; thus students complete the course with a very practical conception of the duties and responsibilities of a professional pilot and a useful background knowledge of aeronautical engineering.

63. The airlines named above represent the typically wide range of commercial aviation activities practised in the United States; Gopher Aviation is a small operator engaging in aviation sales, air taxi work and pilot training, typical of hundreds of small "fixed base" companies to whom approval to train commercial pilots has been given; much of the training is given to private purchasers of aircraft who quite frequently want to qualify themselves beyond the Private Pilot's Licence; North Central Airlines is a "feeder" airline operating short-haul services; North West Airlines is a larger operator with domestic and trans-Pacific routes; United Airlines is a major operator employing over 3,000 pilots. It emerged from discussions with the management of these airlines that in the United States there is a steady stream of young men determined to make a career in aviation. They often pay for their training by doing spare-time jobs between spells of flying and eventually, in this fashion, build up enough flying hours to qualify for a Commercial

Pilot's Licence. It was a firm belief among the American operators visited that this results in a breed of professional pilots who have all the important qualities of initiative and resourcefulness. All the American training establishments and operators visited were very strongly opposed to the concept that entry to a professional flying career should be exclusively through approved courses of training. American operators appear to rely on recruiting new pilots already possessing Commercial Pilot's Licences. The effort devoted to arrangements for further training and competency were impressive, especially among the larger operators.

Australia

64. A scholarship scheme has been in operation in Australia for just over a year, under which the Government grants money for the award of scholarships to assist suitable people to train as professional pilots. Scholarships are awarded to enable pilots to qualify for Commercial Pilot's Licences, Instructor's Ratings, Instrument Ratings, and Agricultural Ratings (a rating peculiar to Australia). To qualify for entry a candidate, who may be male or female, must be educated to a level equivalent to G.C.E. Ordinary level; be under 23 years old (except for Instructors, who may be up to 30); give an undertaking that he intends to make a career in aviation; and have already accomplished 30 hours flying. A Board representing the Department of Civil Aviation and the aviation industry, interviews and selects an appropriate number of candidates. The selection process does not include aptitude or "I.Q." testing but does include a practical flight test. The amount of the scholarship varies with the particular qualification being gained but amounts to 70% of the cost of the flying training involved. The candidate is normally allowed to undertake the flying at an approved establishment in his own home area. Up to November, 1962, 138 scholarships had been granted.

Overseas Students in Britain

65. A significant proportion of professional pilot training in this country is devoted to students from Commonwealth and foreign countries. Most of them attend the various commercial flying schools, clubs and ground schools. Their numbers may be measured by the fact that during 1962, out of a total of 347 new professional pilot's licences issued, 78 went to Commonwealth or foreign citizens, most of whom undertook some or all of their training in this country. In particular, we found that Airwork Services Training, Perth, has built up a considerable reputation in this field. In November, 1962, out of 100 students under training for the Commercial Pilot's Licence at this school, 57 were overseas students.

Chapter 9 - Arrangements in other fields of vocational training and education

66. Training for skilled trades or professions normally consists of practical training and vocational education combined with appropriate studies in the relevant fields of knowledge. Most schemes of vocational education and training are today joint enterprises by industry and the appropriate educational authority. In the case of part-time students at the apprenticeship level, training in the practical skills of the trade or profession is given by the employer, and part-time vocational education by means of a course of further education in a technical college. At a higher level the relevant course for a technologist may be a full-time university degree course extending over three years or more, or a sandwich course, or in some cases an equivalent full-time course at a major technical college leading to the award of the Higher National Diploma, a Central Institution Associateship or a Diploma in Technology. University courses are often supplemented by periods of practical training. In a sandwich course periods of academic study in the technical college alternate with periods of practical experience in industry. The usual pattern is six months of each in all the years of the course, but a number of other variations of the sandwich course exist.

Costs to industry

67. The whole cost of practical training and, in most cases, of the fees charged to the student for the further education course, is met by the employer concerned. In addition, the employer usually meets the cost of maintaining the student while he is following the course, either by the continued payment of wages or salary, or by means of a scholarship. The cost of providing the actual tuition in college (less the nominal fee charged to the student) is met by the providing local education authority, college or university. In a number of cases however it is the practice of employers to finance only the student's periods of practical training in the works, leaving the local education authority to finance the student's maintenance as well as the bulk of his tuition at the college. The cost to industry of this educational support is difficult to estimate but in the case of student technologists, (i.e. where the vocational education course is a degree or diploma in technology course) the cost to the employer per student, for fees, wages and allowances alone, during the course of further education may easily exceed £2,500, plus the additional cost to the providing authority which would not be less than an equivalent sum. To that must be added the cost to industry of providing the associated practical training.

68. Apart from this direct financial support to students, industry often encourages the development of technical education in other ways; it may make gifts of equipment or buildings or make personnel available for representation on college governing bodies and local advisory committees. Industry and the relevant professional institutions play a most important part in the development of technical education. They do this by participation on joint committees set up to consider the standards and content of courses and to assist in moderating examinations of vocational educational courses, e.g. the National Certificate and Diploma courses. Industry is also

represented on various national bodies such as the National Advisory Council on Education for Industry and Commerce, the Scottish Technical Education Consultative Council, the National Council for Technological Awards, and their various Advisory Committees.

Cost to public funds

69. Further education establishments within the public education service are normally provided and maintained by local education authorities, partly from local rates and partly from Government grants to local authorities. Universities, the Colleges of Advanced Technology, the Central Institutions in Scotland, and the National Colleges set up by the Ministry of Education in consultation with the Scottish Education Department at the request of the industries concerned in certain specialised fields (such as rubber technology, food technology and agricultural engineering), do not receive support from local authorities but receive assistance, in the form both of capital grants and recurring grants, from the Treasury, Ministry of Education or Scottish Education Department. There are also a few institutions which receive grants direct from other Government departments, notably the Agricultural Colleges, most of which are at present grant-aided by the Ministry of Agriculture or the Department of Agriculture and Fisheries for Scotland, and the College of Air Training, which receives financial assistance from the Ministry of Aviation.

70. It is difficult to assess the cost to public funds of the vocational education provided in the technical or other colleges but it is estimated that for any particular course, the average net cost (i.e. after taking into account fees paid by the student or his employer) of providing advanced further education in a maintained technical college is of the order of £400-500 for a full-time student for one academic year.

Sponsorship and Maintenance Awards

71. Not all students in further education establishments are committed to a particular employer during their course. Most university students are uncommitted and unsponsored, as are some of the full-time and sandwich students in the major technical colleges; the majority of students on advanced sandwich courses are sponsored by their employers. Local education authorities are under a duty to make maintenance awards to students with certain educational qualifications who are accepted for university first degree or comparable courses, and some 80% of university students receive assistance of this kind from their local education authority. The proportion following advanced courses in technical colleges with assistance from public funds is much lower, partly because of the incidence of industrial sponsorship, and also because of the limited number of full-time and sandwich courses in technical colleges which are designated as comparable with a university degree course. Local education authorities may at their discretion make awards to students not sponsored by their firms who pursue courses at technical colleges not designated as comparable to a first degree course. At the College of Air Training, almost all the students are in receipt of grants

towards their fees and maintenance from their local education authority, because the standard of admission and the general nature of the course make it not unreasonable for these authorities to regard it as similar to one eligible for a university award. The Scottish Education Department makes Students' Allowances freely available to students attending degree and comparable courses, including advanced sandwich courses and the College of Air Training course, unless they are in receipt of assistance from another source, such as an industrial firm, sufficient to meet their expenses.

"Industrial Training: Government Proposals" (Cmnd. 1892)

72. In this recent White Paper the Government reaffirmed the principle that training in fields of industry needing special skills should be undertaken by industry, the Government and education authorities, with industry meeting its share of the expense of training.

Methods of approval and standards of provision

73. The duty of providing a further education service for their areas was placed on local education authorities by the Education Act of 1944 and the Education (Scotland) Act of 1946 and the detailed provisions for approving the service, where approval is required, have from time to time been embodied in Regulations issued by the Ministry of Education or the Scottish Education Department. In general, new provision is approved where the Minister of Education or the Secretary of State for Scotland is satisfied that a need for it exists. Further education is provided to meet the needs of industries with highly specialised techniques, but which do not employ a high enough number of technologists to justify widespread courses on a local basis. This is done, as explained above, by establishing National Colleges which receive a direct Exchequer grant. These are managed by independent Governing Bodies, consisting mainly of representatives of the industries concerned, but including nominees appointed by the Minister of Education and the Secretary of State.

74. When the physical provision has been made, the providing authority (or Governing Body in the case of direct grant establishments) have a large measure of autonomy in the provision of staff, equipment and courses, and the Minister's approval to new courses is required only where these are advanced in nature, or relatively costly to provide. The object behind Ministerial control in such cases is to ensure a rational distribution of provision and the best use of scarce teaching and other resources. A broadly similar control exists in Scotland.

75. The type of accommodation required for any new establishment of further education depends on many factors, including the range of courses to be offered, whether they are advanced or non-advanced, the anticipated number of students, part-time, full-time and sandwich. Detailed guidance on the planning of colleges has been issued by the Ministry of Education in its "Building Bulletin" series. All new establishments or major extensions to existing establishments have to be approved by the Ministry in principle, at

the stage where a schedule of the proposed accommodation has been prepared, and again at final plan stage. As with all other forms of educational building within the Ministry's purview, cost limits are imposed on new colleges or major additions to existing colleges. The position in Scotland is similar.

Inspection of educational establishments

76. All maintained and grant-aided establishments of further education are subject to inspection by H.M. Inspectors. There are two types of inspection. The first is what might be termed the "pastoral visit". This does not often form the subject of a formal report. The second is the full inspection, at which a team of inspectors spends about a week at the college making a detailed inspection which, after frank, confidential discussion with the Governors, is usually the subject of a report to the Minister. Such reports cover the buildings, equipment, staff, courses, and systems of governance, including advisory committees, and they may make recommendations for improvement in all or any of these. Full inspections are not carried out frequently at any one establishment unless there are special circumstances. In Scotland it is not the practice to conduct full inspections of Central Institutions. Visits are generally of a "pastoral" nature.

Ratio of students to staff

77. This varies between colleges, depending on the size of the college and the amount of full-time, part-time and sandwich work at advanced and non-advanced level. The subject being dealt with is also an important factor. Some subjects can be dealt with by lecture, the only limiting factor on the student group being the size of the lecture room; other aspects may best be handled by lesson, with a number of students in the group; yet other aspects may require seminar or tutorial treatment, with one instructor to a small number of students, perhaps even only one in certain cases. In 1959 the estimated overall ratio of teachers to students in establishments of further education, taking account of all types of instruction, was one full-time teacher (or the equivalent in part-time teachers) to ten students. In Scotland the ratio of staff to students is about the same.

General studies in courses of vocational education

78. Vocational education has been sufficiently long established for those responsible for its organisation to be concerned about the need for it to include a broader treatment of the relevant technical subjects, and a certain amount of English and other non-technical subjects.

79. The broader treatment of technical subjects is justified on the basis that it introduces a more complete understanding of the related technologies, and may relate their development to the social conditions in which they occurred. The introduction of English and other non-technical subjects is commended for their value in providing an opportunity to develop a more literate person, capable of playing a greater part both in the industrial

community and also in the wider community in which he or she lives.

80. A recent Ministry of Education booklet "General Studies in Technical Colleges" offers guidance on the content of general studies in part-time courses for craftsmen and technicians. It is hoped by the Ministry that some 90 hours of general studies can be added to a course of some 240 hours a year; at the present time it is proving difficult to secure sufficient day-time attendance to include this additional time.

81. Sandwich courses leading to the Diploma in Technology have, as a condition of approval by the National Council for Technological Awards, to include periods of general studies totalling some 10% or more of total course time.

Teachers in establishments of further education

82. Teachers in establishments of further education are not required, as in the case of teachers in schools, to have the status of "Qualified Teacher". They are recruited mainly on the basis of their educational background coupled with an intimate knowledge of their subject gained from practical experience. Of the 24,600 full-time teachers in establishments of further education, 13,500 hold university degrees or comparable qualifications, and most have had at least several years' practical experience of their subject in industry or commerce. In Scotland there are about 2,000 teachers of whom 1,300 hold university degrees or comparable qualifications. There are special pre-service and in-service courses which technical teachers can take to acquire instruction in the art and craft of teaching. Some of them are part-time, but others, such as those offered at the four Technical Teachers' Training Colleges, are full-time courses of a year's duration for new entrants; for in-service teachers the courses are of 10 weeks duration. In Scotland facilities are available in the Colleges of Education for teachers to receive either pre-service or in-service training.

Recognition of independent schools, etc. as efficient

83. In England and Wales the Minister of Education will recognise certain independent schools and training colleges and other further educational establishments as efficient, but not for the payment of grants from public funds. The Minister's recognition is a special mark of his approval of those independent establishments which reach a certain standard. There is no obligation to apply for recognition and establishments which are not recognised are not necessarily therefore inefficient.

84. The Ministry publishes conditions for the recognition of educational establishments and colleges as efficient. Among other matters, these conditions have regard to a satisfactory level of efficiency being achieved; the provision of efficient and suitable instruction adequate in scope and character for the whole age-range of pupils; a number of pupils sufficient for economical and effective organisation; a teaching staff suitable in numbers and qualifications; accommodation adequate and properly equipped;

and the keeping of such records and registers as the Minister may require.

85. In Scotland independent schools are inspected and registered but there is no system of recognition as in England. Certain further educational establishments which are neither education authority centres nor Central Institutions receive grant from the Scottish Education Department as approved voluntary bodies. These establishments may be visited by H.M. Inspectors.

The pattern of secondary education

86. Since the war perhaps the most outstanding feature of secondary education has been the remarkable development of Sixth Forms. A report of the Central Advisory Council for Education (England), "15 to 18", Volume I, published in 1959, observed that the total number of boys and girls in Sixth Forms in 1958 was about 66 per cent larger than in 1947 and concluded that the absolute numbers in Sixth Forms would continue to grow and that the total in the years 1965-70 would be between 50 and 100 per cent more than in 1958. The Report stated "The only doubt in our minds is whether the rate of growth in the future will be best described as rapid or very rapid". The Statistics of Education, 1962, Part I, published by the Ministry of Education confirm that this anticipated rapid growth is in fact taking place. In January, 1958, the total numbers of pupils in the Sixth Forms of grammar and other schools in England and Wales was 76,279; the corresponding figure in January, 1962, was 121,669, an increase of about 60 per cent. The proportion of all sixteen and seventeen-year olds in maintained secondary schools (to which must be added those in independent schools, technical colleges and elsewhere) continues to rise: in January, 1962, the numbers were 104,600 or 16.6 per cent of all sixteen-year olds, and 60,000 or 8.6 per cent of all seventeen-year olds.

87. In Scotland too there has been a marked tendency for pupils to stay on longer at school. In January, 1958, the total number of pupils in classes SV and SVI in senior secondary schools under the management of education authorities was 11,702. The corresponding figure in January, 1962, was 16,385, an increase of 40 per cent; at the same date, 10,972 sixteen-year olds (14 per cent of the age group) and 7,579 seventeen-year olds (9.8 per cent of the age group) were in education authority secondary schools. As in England and Wales there is also a considerable number of sixteen and seventeen-year olds in grant-aided and independent schools.

PART III

FUTURE ARRANGEMENTS

Chapter 10 - Estimated future requirements

88. It was generally agreed among our witnesses that any coherent national system of pilot training, however arranged or financed, must be based on a reasonably steady number of students. We share this view. Estimating the numbers of professional pilots likely to be needed is difficult because of the fluctuations and uncertainties associated with civil aviation. We noted, for example, that the Wilcock Committee's fears (mentioned earlier in paragraph 6) about the possibility of a serious shortage of pilots were not in fact realised.

Service recruits

89. Although the White Paper "Aviation Safety" implied, and many witnesses assumed, that for the future civil aviation would no longer be able to rely on recruits from the Services in sufficient numbers to meet long-term requirements, we thought it essential to verify independently the extent to which experienced pilots from the Royal Air Force might still be available in the future. Like the Wilcock Committee we felt that from the point of view of the national economy the fullest use should be made of any available ex-Service pilots. We concluded, however, that the Royal Air Force recruitment policies described in Chapter 7 indicated clearly that the requirements of civil aviation and the Services have now diverged. Both have now settled, through schemes like the College of Air Training and the Supplementary List Permanent Commission, for a full career structure for their pilots, starting with the schoolboy entrant. The basic career for officers on the Supplementary List will be 16 years, or until about the age of 38. General List officers have career prospects until 55, and we learnt further that the most able of the Supplementary List officers would certainly be offered opportunities to continue in the Service. The Air Ministry does not expect many to exercise their option to leave after 8 or 12 years. There is also a steady flow of extensions to the "38/16" scheme among holders of commissions for less than 16 years. Over the next four years an average of about 80 pilots serving with non-pensionable commissions (i.e. less than 16 years) are due to leave each year, but these are gross figures and many will doubtless wish to leave flying altogether and others will be offered and accept extensions of their commissions into the "38/16" scheme.

90. We explored with the Air Ministry and other witnesses to what extent those leaving at the "38/16" point, mainly from the Supplementary List, might constitute a pool of trained pilots for civil recruitment. There was general agreement that in principle a scheme might be attractive whereby pilots were recruited and trained in the Royal Air Force, preferably for service in Transport Command, served until the "38/16" point, and then left for guaranteed posts with civil operators. (For reasons of policy the Air Ministry were not prepared to release pilots before the "38/16" point.)

It was generally agreed, however, that such a scheme would have several insuperable practical drawbacks. First, civil aviation and the Services are in competition for basically the same recruitment material; therefore there would be a natural tendency on the part of the Royal Air Force to want to retain the most able pilots, leaving the rest for civil aviation. Secondly, there is the very serious industrial problem of integrating experienced pilots of around 38 into the strict promotion and seniority system which is operated in the Airways Corporations and some other civil airlines. It was represented to us that operators are reluctant to accept such pilots. Furthermore, at this age ex-Service pilots would almost certainly resent going to the bottom of the ladder as junior co-pilots, especially after enjoying early command experience in the Royal Air Force; even if the salary as a co-pilot were reasonably attractive, the absence of any firm prospects of achieving command would act as a strong deterrent to recruitment. We concluded that these factors would inevitably make entry into civil aviation unattractive for men leaving at the "38/16" point, with useful pensions and a full and satisfying flying career behind them. We are in no doubt that unless Royal Air Force recruitment policy changes, the once regular supply of young men with Service flying training and experience cannot be a reliable source for civil aviation.

91. For the immediate future such Short-Service Commission pilots as become available will still provide a possible source of recruitment for civil operators, until the full affect of the "38/16" policy is experienced. We have given careful consideration to the views expressed by a limited number of persons to the effect that experienced Service pilots should be excused the examinations and flight tests for professional civil licences and the instrument rating. While all candidates are required to pass the appropriate ground examinations, the Ministry grants concessions appropriate to the experience of individual pilots in respect of flight tests. We are of the opinion that the licensing requirements are reasonably applied and that no major changes are needed in this area.

Short-term requirements

92. All the evidence we received indicated that at the present time there is no shortage of pilots and we could detect no alarm among our witnesses about supplies for the immediate future. Our witnesses variously estimated that at the moment there are from 100 to 150 professionally licensed pilots unemployed and that some airlines are employing pilots who are temporarily surplus to needs. The current pessimism among operators was amply demonstrated by some figures supplied to us by the Standing Joint Committee on Recruitment to Civil Aviation from the Services: whereas in January, 1962, operators believed they would need some 300 more pilots over the next two years, in July, 1962, they estimated the figure would be of the order of 200. The introduction of larger, faster types of aircraft with a greatly increased carrying potential, coupled with a slowing down in the predicted rate of expansion of traffic, has left most operators with considerable excess capacity. Many more passengers could be carried without a comparable increase in the number of pilots employed. In these circumstances we

concluded that for the immediate future there is little prospect of a shortage of pilots, and that the present pool of unemployed pilots, the existing output of flying schools, and the numbers still leaving the Services, should suffice to fill any fresh vacancies in the next 2 to 3 years.

Long-term requirements

93. We next examined the assumption in the White Paper "Aviation Safety" that about 200 new professional pilots will be required annually in the future. In the short-term, the considerable unused capacity in airlines could mean that business could expand for a while before more aeroplanes and pilots were needed. There are two factors, however, which led us to conclude that for the long-term the White Paper estimate was soundly based. These are the past statistics on the growth in the number of professional pilots and the number of new licences issued, and the effect which the present imbalance in the age structure of the professional pilot body will have on future wastage from retirement.

94. An extrapolation from past statistics on the growth in the number of pilots employed and licences issued, prepared by the Ministry of Aviation, suggested that the future annual requirement was of the order of 200. The total number of professional licences held has increased steadily from about 2,200 in 1952 to about 3,800 in 1962, but there have been considerable fluctuations in the annual totals of Commercial Pilot's Licences issued, possibly reflecting shifts in the fortunes of the airline industry:-

1953	324
1954	239
1955	173
1956	303
1957	435
1958	491
1959	249
1960	124
1961	273
1962	334

Over this ten-year period, despite fluctuations, the average number obtaining licences was about 290.

95. The graph at Appendix V is based on the number and ages of licensed professional pilots in 1961. The two "bulges" represent the recruitment of large numbers of men of similar age from the Services after the war and from Short-Service Commissions in the early 1950's. Graphs received from some operators showed the same pattern. The implications of the two "bulges" are clear; even assuming that the total demand for professional pilots in airline employment remains constant, 200 or more new civil pilots will be needed each year between 1975 and 1980 with a theoretical peak of 350 in 1977, in order to meet wastage from retirement. Slightly smaller numbers, rising to a peak of 200 in 1988, appear to be required to meet the

accelerated rate of retirement between 1984 and 1990. These retirement peaks will tend to be slightly flattened due to premature retirement and replacement from ill-health and other causes, but overall, the forecast retirement rate coupled with any general growth in airline flying, points to the soundness of a long-term annual estimate of 200 new professional pilots.

96. At present, general and executive aviation employs about 10 per cent of all professional pilots. For various reasons, it is unlikely that general and executive flying will ever achieve the rate of growth experienced in the United States of America and at the moment it is probably also not developing at the rate anticipated by some of its most enthusiastic supporters. On the other hand it is potentially the most likely field of significant growth which will ensure the need for the annual numbers of new pilots we have discussed.

97. So far we have been considering the requirements for British professional pilots. We have described earlier how foreign and Commonwealth students are attracted here for their pilot training. This demand from overseas, which we hope will continue, will almost certainly be additional to the 200 figure for British pilots, and leads to the conclusion that future civil pilot training facilities in this country should be capable of meeting the requirements of about 250 pilots a year.

Machinery for forecasting numbers

98. The imbalance in the age structure of the professional body which we have referred to earlier, will require a planned programme of recruitment to avoid large fluctuations in the demand placed on training establishments. Many witnesses urged the need for central national planning machinery in this field. We accept the need for such machinery, but consider that employers of pilots must accept their responsibility, as do other employers, for ensuring that a sufficient supply of skilled staff is maintained. We recommend that the role of the Ministry of Aviation should be to provide, through the Standing Joint Committee on Recruitment to Civil Aviation from the Services, the administrative machinery for the co-ordination of all operators' forecasts of future requirements of pilots and information about the numbers of pilots who may become available from the Services. For the purpose of forward planning the present practice of the Standing Joint Committee in arriving at forecasts for only two years ahead, ie inadequate, and is too much influenced by temporary fears caused by short-term fluctuations. While we appreciate the factors which were advanced to us as typical of the difficulties of long-term forecasting in this field, we concluded that such difficulties were inherent also in many other fields of commercial activity. We recommend, therefore, that the present practice of six-monthly forecasts for two years ahead should be discontinued and that the Standing Joint Committee should issue estimates for at least a period of five years ahead. We had evidence that the larger operators already give considerable thought to long-term planning of pilot recruitment; there is danger both from the commercial and safety points of view if "hand to mouth" policies continue elsewhere.

99. Finally, we recommend that the title of the Standing Joint Committee should be now amended by deleting "from the Services" to reflect the change in the recruitment situation since the Committee was first set up.

Chapter 11 - Selection and recruitment

100. Many of our witnesses referred to the need to make more widely known among young people the prospects and opportunities of careers in civil aviation. Most witnesses also expressed their anxiety to recruit the best possible kind of person. We have already noted the tendency for young people to stay on longer at school and in future civil aviation will inevitably have to look for most of its recruits from amongst boys (and girls) who have passed their General Certificate of Education at Ordinary level and who are in the Sixth Forms of schools, studying to Advanced level or the equivalent educational level in Scotland.

101. Young people entering the Sixth Form usually follow courses of study which will enable them to enter a particular course of further education leading to a professional career. If, at this stage, no opportunities are available for them to develop their enthusiasm and interest in the direction of a flying career, most of them will probably make up their minds to pursue other careers when they leave school. We considered several suggestions for increasing awareness of civil aviation as a possible career among young people at school, such as the use of publicity techniques similar to those practised by the Royal Air Force (described in paragraph 53), which might be financed by employers and the Government. For the relatively small numbers required, such recruitment methods for civil aviation would be extremely expensive and uneconomic.

"Junior Wings" scheme

102. Without a suitable scheme, future recruitment for professional pilots and other civil aviation posts will inevitably suffer, especially in competition with the other industries and professions. We recommend that a more satisfactory and economical method of recruitment and selection would be the introduction of a scheme - which we call the "Junior Wings" scheme - designed to introduce boys and girls to flying while at school. Such a scheme should provide up to 1,000 scholarships each year to assist boys and girls undergoing full-time courses of education, to obtain up to ten hours flying instruction and to make a first solo flight. They would then qualify for the award of a "Junior Wings" Badge. As a solo flight cannot be made before the age of 17, most applications for scholarships would come from pupils in the Sixth Forms and we consider that only those who had attained a standard of five Ordinary level passes, or equivalent, including English, mathematics and a relevant science subject should be eligible for assistance. In addition, a medical standard equal to the professional pilot level should be required. We estimate that such a scheme would cost about £50,000 a year. The bulk of this should be provided by the Exchequer; but it is likely that local education authorities would be anxious to be associated with such a scheme. Already there is an interesting venture of this kind, called the North Norfolk Youth Flying Club, which has been made possible by the co-operation and financial contributions of the local education authority and a private flying group.

103. We consider that a scheme on these lines would reap benefits out of all proportion to its relatively small cost, when compared with that of conventional recruitment and publicity techniques. It would introduce young people to flying, an experience normally completely beyond their reach, because of its expense and the small scale of private and general aviation here, compared with countries like the United States. A first solo flight has a considerable challenge and the scheme would rank equally with schemes in other fields as an outdoor pursuit of considerable character building and educational value. If the flying for such a scheme were restricted to those clubs approved by the Ministry of Aviation for the purposes of instruction for the Private Pilot's Licence and arranged to take place during the week, it would make a considerable contribution to the health of club flying and to the demand for adequate instructors. The introduction to flying would probably also encourage young people to continue flying, at their own expense, to the full standard of the Private Pilot's Licence.

Selection for professional pilot training

104. The scheme we suggest, besides its general contribution to airmindedness, would create a pool of possible recruits for professional flying, who met the basic requirements which our witnesses in general agreed were essential - a standard of academic attainment, physical fitness and proven ability to "go solo". In any scheme of professional pilot training, proper initial selection will be essential because pilot training is expensive and to have to reject students after they are part-trained leads to waste of money. Potential recruits should undergo selection processes, suitably shortened for those who had already demonstrated their ability through the scheme suggested above. Such selection might be connected with any central body set up by the Government, operators and other sponsors to administer funds for pilot training as discussed in Chapter 14.

Career prospects

105. In Chapter 5 we described some of the types of employment in which a professional pilot might engage. His career prospects in the chosen branch of his profession are obviously relevant to the problems of recruitment. We have noted that most pilots are employed by airlines and a career as an airline pilot has several obvious attractions, such as the prospect of earning a good salary at a comparatively early age, opportunities for visiting overseas countries and for meeting people of many nationalities and accomplishments. In the case of young men for whom flying has an intrinsic appeal, these and other attractions will probably outweigh some of the disadvantages of the career, such as the exacting responsibilities, the regular checks on health and competence, irregular hours of duty, and, according to the kind of service operated, periods up to several weeks away from home.

106. The emoluments and conditions of service for airline pilots in general appear to be very good and there is well-established machinery for negotiation on these matters within the National Joint Council for Civil Air Transport. Security of tenure is also another important factor in attracting new

recruits and we were pleased to note that the seasonal employment of pilots is tending to become a less common practice among the larger independent operators, although the risk of unemployment and redundancy still appears to exist in some sectors of the industry. In branches of professional flying such as executive and agricultural work, test-flying and instruction, pay and conditions of service vary and each employer still makes his own terms with his pilots.

107. Apart from the lack of a well-defined method of entry into and training for the pilot's profession, on which we make recommendations later, we consider the chief deterrents to recruitment to be the relatively early retirement age, the risk of unexpected premature retirement, and the relatively poor promotion prospects which now face able and ambitious young men entering the airlines as second officers.

Retirement

108. The Wilcock Committee found that the normal retirement age in 1948 was about 45. We found that this has now risen to about 55 and that normal retirement at this age was provided for in the Airways Corporations and most independent operators by pension schemes. The levels of pensions provided and the high incomes enjoyed at a comparatively early age compensate in some measure for the loss of professional earning capacity at ages when most men have many more years of their working lives remaining, there being only a limited number of ground posts in airlines in which retired pilots can be absorbed, whether at age 55 or earlier.

109. The risk that a professional pilot may have his flying career prematurely and unexpectedly terminated, with all that this means in terms of a drastically reduced income, can probably only be adequately covered by insurance. Most operators in fact insure their pilots against injury or death on duty. We found in addition several insurance schemes in existence whereby professional pilots can provide for a substantial sum of money to assist them in the event of their losing their licences.

110. Despite the difficulties, which we acknowledge, we consider that the loss to aviation of the accumulation of very expensive training and valuable experience possessed by mature professional pilots, should not be accepted unquestioningly, either on normal or premature retirement. We recommend that employers and representatives of pilots should consider together ways of providing, wherever possible, for the re-absorption of retired pilots within the aviation industry. Opportunities should also be provided for such pilots to adapt themselves by further training for other walks of life. Such provision would, we consider, assist in dispelling any impression among school-leavers, teachers, and parents, that a professional pilot's career was too risky.

Promotion to Captain

111. In choosing a profession, an important consideration is always whether

it offers reasonable chances of advancement to higher levels of income and responsibility and the opportunity, however slender, to compete on merit for the highest posts. We have noted the comparatively limited length of the airline pilot's career and have made recommendations which, if implemented, might assist on occasion in extending his working life. Within airline companies, apart from the few senior pilots singled out for specialised flying posts, such as flight and training captains, and for the few available senior administrative posts, most pilots' hopes of advancement are necessarily centred on promotion from the junior grade of Second Officer, through that of First Officer, to the rank of Captain.

112. Policies on promotion are a matter for agreement between the pilots' Association and the individual employers. We explored the operation of these policies with the relevant witnesses. We learnt that in the Airways Corporations, promotion was governed by a strict system of seniority including a "bidding system", whereby when vacancies occurred for pilots, (on the introduction of a new aircraft type for example), the most senior pilot among those technically qualified to apply, had the first chance of applying for the vacancy and attempting the necessary conversion course. The "bidding system" is significant because pilots' salary scales vary not only according to rank and seniority but also according to the size of aircraft flown. It is clear that these promotion policies, coupled with the present imbalance in the age structure of the professional pilot body and the operation of aircraft fleets mainly composed of large aircraft types, mean that the prospects of new entrants to the Airways Corporations of achieving command at a reasonably early age are extremely remote, even for the most able. Both Airways Corporations told us that new entrants with all the necessary potential qualities for command, such as those carefully selected and trained at the College of Air Training, could still expect from ten to fifteen years of co-pilot service as a Second and later a First Officer, before they were likely to be in the running for promotion to Captain. Cadets sponsored by the Corporations at the College are specifically told this on entry and are warned in addition that not all of them can expect to achieve command.

113. The problem of promotion is probably slightly less acute in British United Airways where we learnt that the Company, when selecting Captains for new types of aircraft, also takes into account a number of commercial factors which might rank above strict considerations of seniority. Here again new recruits are explicitly warned that promotion to Captain is neither certain nor rapid. We recognise that in the circumstances existing after the war, when there were considerable numbers of pilots of similar age and experience, in the interests of fairness to all concerned there were good reasons for introducing a rational system of promotion for pilots. Now that civil aviation must recruit its own pilots, in competition with the Royal Air Force and many other employers seeking recruits of high calibre, there is a danger that the continued operation of the present rigid concepts of seniority and promotion may positively harm recruitment. The operation of these concepts tends to hold back able and ambitious young pilots; when they are older we found evidence that pilots sometimes find conversion to modern jet aircraft more difficult than younger pilots. A long spell of co-pilot

service also limits very considerably the opportunities for young pilots to enjoy early command experience. In the Airways Corporations this problem is particularly aggravated by the absence of small types of aircraft, whereas in certain of the independent airlines the problem is eased to some extent by the availability of a greater diversity of types which enables young co-pilots to get early responsibility on small aircraft. In British European Airways the problem is partly alleviated by the practice of the "monitored approach" system, whereby all co-pilots from a very early stage in their careers are given real and exacting responsibility for flying the aircraft on bad weather approaches, under the supervision of their Captain.

114. We consider therefore that the long spell of co-pilot service which at present faces new recruits to airline flying, especially in the Airways Corporations, will tend to stultify interest, initiative, and enthusiasm for flying, and may constitute a positive deterrent to the recruitment of good material. We recommend that operators and pilots should review the present promotion policy and consider the introduction of less rigid practices of promotion and seniority, in which the claims of real merit receive at least equal consideration with those of seniority, as in other professions.

Women as professional pilots

115. So far in this report we have made no specific mention of women pilots in commercial aviation. This is not because we have been unmindful of their right to be considered, but simply because the proportion of women pilots in this field is so small. It seems unlikely that airline operators would be prepared to employ women pilots, though we believe there have been isolated cases of their doing so in other countries.

116. Apart from airline flying there may be other opportunities for women pilots to find professional employment, particularly as flying instructors. Some are already doing valuable work in this capacity. If general and executive aviation continues to grow, additional opportunities may also arise. The wartime contribution of the women ferry pilots of the Air Transport Auxiliary certainly demonstrated their potential capability.

117. For these reasons we would not wish that any of our recommendations should be implemented in such a way as to debar or discourage the very limited number of women likely to come forward for professional pilot training. Suitable arrangements for such training should be kept available within the framework of the approved courses for professional pilots which we recommend later. Although the number of women wishing to apply for such training is likely to remain extremely small for the foreseeable future, nothing should be done to prevent a natural increase if this can be justified by growing opportunities or by future demand for their services.

118. In considering the arrangements needed for training in the future we were much impressed with the need for diversity in the non-flying qualifications of pilots. Major operators, such as the Airways Corporations, expect to recruit a proportion of their senior management from their flying staff; in addition they need technical and development pilots in limited quantities for work on new types of aircraft and equipment. They also expect that many of their new entry recruits will never in fact be promoted to Captain. Any attempt to impose too uniform a standard must lead to future difficulties. If the standard is set too high, recruitment may be difficult, and frustration will occur in the years ahead when able First Officers realise that their opportunities for gaining a command are limited. If it is set too low, entrants with managerial and technical qualifications may not be forthcoming.

119. Although virtually all witnesses and the White Paper "Aviation Safety" assumed a strong link between initial training standards and the safety of public air transport, we found it impossible to obtain firm evidence to support this opinion. The view expressed in the White Paper is that "Good instruction and training, allied to a sound level of general and scientific education are essential if civil pilots are to cope safely with the increasingly complex business of flying modern aircraft. ...... The standards of training at civil flying schools where potential pilots receive their initial training, and the methods of selection of the recruits, have therefore become of greater importance to the safety standards of public transport." It seems sensible to accept this majority view, but we have continually reminded ourselves that a consistently high standard of safety has been attained in the United States of America, where extreme diversity exists in the initial training of pilots. Since safety is the argument generally advanced in support of better training standards and as no correlation appears to be established at present, we recommend that research be undertaken in this field. In particular training records need to be maintained throughout the working life of all professional pilots, so that they may be available as evidence when incidents or accidents occur. The lack of such records is a serious omission from the source material available for flight safety analysis.

120. We explored both in discussion with our witnesses and among ourselves the main proposal in the White Paper that "To ensure that professional pilots receive a full and proper training, and to secure that candidates do not present themselves for examination inadequately prepared", it was intended to require all candidates for the Commercial Pilot's Licence to produce evidence that they had attended an approved course of instruction. (The date given in the White Paper for the introduction of this requirement was the 1st January, 1964; in an answer in the House of Commons on 14th March, 1963, the Parliamentary Secretary to the Ministry of Aviation announced that the introduction of this requirement would be delayed for at least a year in order to allow time for our recommendations to be considered.)

121. We were impressed by the weight of evidence about the poor standard of preparation of some candidates for the Commercial Pilot's Licence, as

shown by the low proportion of candidates passing their ground examinations and flying tests at the first attempt. This evidence generally confirmed that candidates who had acquired their flying experience and ground instruction over a period of time in a piecemeal fashion, instead of following a properly organised sequence of training, tended to fare particularly badly in the examinations.

122. Although, as mentioned above, it is not possible to establish a statistical correlation between training methods and safety, nevertheless we are of the opinion that proper basic training, especially in flying training, is desirable as a sound foundation. In other fields, parents, teachers and students can usually find specific courses of training and education laid down by the relevant authorities, industry or professional body. If the professional pilot body is to achieve appropriate status it also must have well-defined methods of entry and training.

123. To sum up, we deprecate the piecemeal training of professional pilots and as a general principle we support the concept of approved courses for professional pilots as the future training pattern. The bulk of the evidence received supported this concept. As we describe later we do not rule out - and here there are ample analogies in other fields of training and education - the possibility that the pattern should permit flexibility by allowing those who have exceptional ability, qualifications or experience to qualify as professional pilots without having necessarily completed a course of training approved for normal entrants. We also indicate later that approved courses may take more than one form.

Approved courses and concepts of training

124. To enter professional flying, a pilot must have as a minimum a Commercial Pilot's Licence. In practice he also needs an Instrument Rating if he is to fly on public transport flights. The standards for these qualifications reflect the accumulated experience of the member nations of the International Civil Aviation Organisation. The standards and privileges of the Commercial Pilot's Licence and those of the senior licences to which the junior pilot may progress are described in detail earlier. The licences are arranged to provide for progression to increased privileges as experience in terms of flying hours increases. Apart from the very rudimentary knowledge demanded in the basic licence, there is generally accepted recognition of the value of experience and of the fact that professional pilots' work, although involving certain levels of technical knowledge and expertise, is mainly an operative practical job. Throughout the world, men of different nationalities, educational standards and social background, have been able to qualify for the junior licence as laid down by the International Civil Aviation Organisation, and thence by experience have eventually become satisfactory commanders of large aircraft flying the world's routes.

125. We recommend, therefore, that the minimum course of training for professional pilots need only be sufficient to cover the requirement for

adequate preparation for the examination syllabus laid down for the Commercial Pilot's Licence and Instrument Rating. At the present time it appears that such a course takes from 12 to 15 months. We recommend that ground and flying instruction should follow a logical sequence so that the student has an opportunity to study the relevant subjects and apply in the air what he learns progressively throughout the course. Such courses, subject to meeting the conditions of approval which we consider later, should continue to qualify for the reduction of the number of flying hours required for the Commercial Pilot's Licence, from 200 to 150. On the other hand we do not think candidates should be barred who have received proper instruction at geographically separated ground and flying schools, providing they are both approved, that continuity has been maintained, and all the training has been completed within a reasonable period of time. In such cases the reduction in flying time mentioned above should not be allowed. The need for good continuity in introducing pupil pilots to the air, is an essential requirement if much valuable flying time is not to be wasted. The value of previous air experience is much reduced if significant gaps are allowed to occur in a course of flying training.

126. With regard to educational qualifications, we recommend that a requirement be introduced that all applicants for the Commercial Pilot's Licence should have obtained five Ordinary level passes in the General Certificate of Education, including mathematics, English and a relevant science subject, or equivalent. In the view of most of our witnesses this was not an unreasonable minimum level of general education to require of future professional pilots, and courses at this level are widely available for those who for some reason or other have been unable to gain them through normal secondary education. The young people qualifying for the award of a "Junior Wings" Badge, who we have suggested might form the main source of future recruitment, would normally possess the Ordinary level qualifications we recommend, and would be following a course leading to Advanced level. We also noted in paragraph 36 that there is as yet no proven correlation between the desirable abilities and qualifications of a pilot and his academic attainments. We recognise however the benefit gained from the broadening of the mind and the developing sense of responsibility which takes place in the Sixth Form and consider it would be desirable for applicants to have two passes at this level with schooling or other educational experience continued until the age of 18. At the moment we feel that to fix the basic minimum standard at this level would rule out useful pilot material which we can ill afford to lose. Bearing in mind the trend towards the larger Sixth Form which we mentioned earlier, we recommend that the educational requirement be kept under review to see whether two Advanced level passes should be made mandatory at a later date.

127. The approved minimum course should also have sufficient flexibility to enable experienced persons to be fitted in somewhere at an appropriate point according to their age and qualifications. We have in mind, for example, the experienced ex-Service pilot who might require only a short ground course before taking his licence examinations, pilots from private and general aviation who have acquired considerable experience over a

number of years - we think 1,000 hours ie a rough guide to an adequate amount of experience - and persons with advanced qualifications or of maturity or standing who should not need to follow the full course alongside schoolboy entrants. Provision should be made in any new licence requirements and conditions for approved courses, for the Minister of Aviation to be able to exempt such people and substitute an appropriate reduced course.

128. In particular, the case of graduates in relevant subjects such as physics, aeronautical engineering or mathematics, who wish to become professional pilots, should receive very careful consideration. There is some evidence that there is a limited but significant number of such graduates who have a keen desire to fly and that they could be attracted to the career in future provided a suitable course of reduced length could be arranged which did not result in their losing seniority as compared with non-graduate entrants. The advantages to the profession and to the industry of a small proportion of graduate entrants would be considerable. Such an intake would also be of special value as it would bring into the profession able young men of versatility whose careers would not necessarily be confined to flying. Such men would be a valuable source from which some future senior airline captains, project and development pilots, and perhaps some airline managers could be drawn.

129. Graduates in engineering, physics and mathematics, because of their maturity, advanced qualifications and small numbers, cannot easily be fitted into courses for school-leavers of about 18. It would be more appropriate for mature men with degrees in these disciplines to receive their training in an establishment experienced in post-graduate training, in the main stream of aeronautical development, and possessing facilities for flying training. Such an establishment exists at the College of Aeronautics, Cranfield, and we recommend that consideration should be given, in consultation with the College's Governing Body, to the establishment there of a suitable course of pilot training for a small number of graduates.

130. Finally we stress that the numbers following special courses would be very small; the day of the rugged individualist who fought his way through to a professional pilot qualification is probably over, but here again we feel strongly that the professional pilot body to be healthy needs as much diversity as it can get.

131. Although not basically essential for the approval of the minimum course of training we have been describing, we consider, for the reasons given earlier in paragraph 79, that it would be desirable for courses to include a broad treatment of technical subjects and a certain amount of English and general studies.

132. Unless courses are widely based and go beyond adequate preparation for the Commercial Pilot's Licence and Instrument Rating syllabus, it is doubtful whether those advising future school-leavers would consider them suitable for the senior pupil, nor would the courses reach the standard normally provided for students going on to higher education. Nevertheless

the desirability of widely based courses of vocational training, increasingly accepted in other fields, may in the case of pilot training, inevitably have to be tempered by economic and other considerations. The scope and content of studies added to the minimum course we consider essential, must depend ultimately on the individual needs of employers, their attitudes to training, the financial climate of the industry and the amount of financial assistance that may be expected. In time, in order to attract recruits leaving school at about 18 of the quality operators require, courses which are liberal in their interpretation of the educational needs at this stage of a young person's career may well become essential. We can foresee that there might be a requirement in future for various combinations of vocational training, as represented by the minimum course we recommend, general studies and specialised training. Airlines which sponsor and introduce new equipment need to attract a leavening of pilots with special talents in the field of engineering and allied skills. In addition to engineering, various witnesses have suggested to us requirements for tuition in managerial and business techniques, languages, and agriculture, chemicals and fertilisers. Appropriate courses for some of these additional studies are already available, or could be arranged, using existing educational facilities and qualifications.

133. The addition of these further studies to the minimum course would need to be carefully arranged so as not to break the essential continuity of the carefully phased programme of basic ground and flying training. It would be advantageous if such studies could be undertaken, wherever possible, before or after the completion of the minimum course, either at, or in close association with, an educational establishment providing advanced courses. The reason for this is that flying schools suffer from being "monotechnic" institutions; unlike the "polytechnic" institutions having a diversity of faculties, staff and pupils, they exist solely for the purpose of training pilots, tend to be relatively small and are therefore unable to offer students and staff the stimulus which comes from wider contacts between different academic disciplines and ways of thinking.

134. Different approaches to the basic training of professional pilots are illustrated by comparing the concepts on which the two existing approved courses are based, at the College of Air Training, Hamble, and Airwork Services Training, Perth.

135. At the College of Air Training, in addition to the high standards of entry and selection which we have described earlier, the Airways Corporations have devised with the Ministries of Aviation and Education an initial two-year course comprising theoretical studies extending in the relevent technical subjects (but not in flying experience) beyond the requirements of the Commercial Pilot's Licence syllabus and even in advance of the level required for the Airline Transport Pilot's Licence. The course also includes related general mathematical and scientific studies, and some liberal studies. The course is primarily designed to meet the Corporations' special need to attract, recruit and train young men with the necessary intelligence and personal qualities to become commanders of large jet aircraft. Cadets leave the College with the basic professional entry qualification of the Commercial

Pilot's Licence and Instrument Rating. They still require the necessary hours of operational flying experience, which will take several years to obtain, before qualifying to sit for the senior licence of Airline Transport Pilot.

136. At Airwork Services Training, most ab-initio students follow a basic course limited solely to coverage of the Commercial Pilot's Licence and Instrument Rating syllabus. They then enter employment, obtain early experience and are able to develop operational maturity under the eyes of senior pilots. Because many independent operators have more diverse fleets than the Corporations, the new pilot is likely to obtain greater responsibility on the flight deck earlier in his career. At the appropriate stage, he will need to attend a ground course for the Airline Transport Pilot's Licence, which takes from 4 to 6 months. This is fully in line with current international licensing practice which, rightly in our view, is designed to ensure that the young airline pilot's training is soundly based on a gradually widening foundation of practical experience, which eventually becomes sufficient for him to sit for his senior licences.

137. The Ministry of Aviation, supported by the Ministry of Education and the Scottish Education Department, in fact argued that the educational standards of entry and the scope of the course at the College of Air Training were basically essential for the initial training of all future airline pilots. They strongly supported the thesis that a professional pilot who is destined for a career as an airline pilot should, in addition to technical proficiency in flying and a knowledge of the theoretical background, have a good general education in an environment which will develop his personal and intellectual qualities. The Airways Corporations also supported the standards set by the College course as the basic minimum for airline pilot training in the future and regarded its educational, selection and other standards as essential to ensure an adequate supply of trained pilots with the necessary intellectual qualities and personal attributes for command.

138. We recognise the value of the College's liberal approach to training, although we consider that it is at a higher level than the minimum, for the reasons given in paragraphs 124-133, and inevitably more costly. We note that the planning of its course calls for special care if interruption of the essential continuity of the basic vocational training is to be avoided and if the inherent drawbacks of a 'monotechnic' establishment are to be overcome. The arrangements for graduates at the College are open to the objection noted in paragraph 129, and we would refer to our proposals for graduate training at the College of Aeronautics, Cranfield. The need for a growing emphasis on the importance of commercial aviation experience among the staff, particularly the senior members, mentioned later in this report in paragraph 142, is particularly pressing in a college working to high standards, and is no doubt appreciated by the Governing Body of the College of Air Training. We have not the resources to assess the validity of the criticisms of the College made by some witnesses, but we are aware that any institution pioneering a new form of training, as the College is doing, must encounter difficulties in its formative years. In the case of the College,

it can be anticipated that its Governing Body will not grudge giving it their particular care and attention until it is established at the very high level intended by its sponsors. We have no doubt that it is already performing a useful function.

139. The Ministry of Aviation told us that they had been considering a requirement whereby all co-pilots on public transport aircraft should hold Airline Transport Pilot's Licences and not as now only Commercial Pilot's Licences. Their licences could be rated as First Officer only, but the standard of examination and initial qualification would be as it is now for the Airline Transport Pilot's Licence, except for the number of hours flying. The Ministry informed us that the idea had not so far been pursued in discussion with interested parties whom they would of course wish to consult before making such a change. The Commercial Pilot's Licence would be relevant to those professional pilots not flying in public transport aircraft - those engaged in crop spraying, surveying, executive flying of smaller aircraft and the like. For these pilots, the requirements of the present examination for the Commercial Pilot's Licence and the Instrument Rating would remain. The Ministry believed that a course of instruction, as at present approved at Airwork Services Training, Perth, would be adequate.

140. We thought that the Ministry's suggestion for changes in licence privileges, if ever proceeded with, would depart too radically from international practice and place an unnecessary additional financial burden on British operators. We are doubtful for example, whether the level of operational experience with which cadets leave the College of Air Training is sufficient background against which the wider knowledge at the level of the Airline Transport Pilot's Licence imparted during the College course can be properly assessed and evaluated. We could see little practical value in any suggestion that would allow an inexperienced young pilot to obtain a "junior" Airline Transport Pilot's Licence on the strength of theoretical knowledge not preceded by practical experience. This knowledge could not be utilised in operation because of the young pilot's inexperience, and we feel it would tend to be quickly forgotten. A return after adequate operational experience, to a course of study for the senior licence is in any case necessary. The long spell of co-pilot service (as much as 10 to 15 years in the Corporations, we understand), which faces the young airline pilot before he has any hope of achieving command, could be frustrating to the ambitious and keen young pilot and could be better approached if broken up with a spell of study, preferably full-time, at a ground school for the senior licence. This would relieve the frustration to some extent, provide a goal to be achieved as a natural progression from his first licence, and also demonstrate his ability successfully to negotiate further study, bearing in mind that throughout his career he will have to relearn and adapt as he progresses by various types of aircraft. Further, the rapidly changing technology of aviation makes it desirable that young pilots should not sit for their final theoretical examinations for the Airline Transport Pilot's Licence at a point in time too far ahead of gaining their first command. Otherwise the basic standard of the examination syllabus may be too historical to be relevant and duty as a co-pilot may not provide much natural incentive to keep up-to-

date. The Ministry suggestion would also in effect tend to lower the status of the Airline Transport Pilot's Licence, which is at present internationally recognised as a mark not only of a certain standard of theoretical knowledge, but also of operational maturity.

141. We stress the need, whatever the extent and scope of the initial course of training, for the young pilot to return at the appropriate point in his career for tuition for his Airline Transport Pilot's Licence. Courses of the kind at present provided at the specialist ground schools listed in Appendix IV would be sufficient.

Chapter 13 - Approval of courses

142. We received views on the standards of approval for courses of professional pilot training. We felt that the working out of these standards in detail should be a matter left to the Ministry of Aviation who would be responsible for inspecting and approving courses (in association with the Ministry of Education and the Scottish Education Department), and that they should seek the advice of interested organisations, perhaps via a joint committee. We have given some thought to the range and scope of the matters which ought to be covered in a list of conditions of approval. We recommend that as soon as any decision is taken to introduce a system of approval, the relevant standards should be worked out and properly published in detailed form by the Ministry of Aviation at the earliest opportunity, so that organisations seeking approval may know the standards required. In this respect we were impressed by the very detailed set of requirements published by the United States Federal Aviation Agency for the approval of courses. Among the matters we feel ought to be covered are:-

Curriculum

The courses being considered for approval should be set up to train to the level of the Commercial Pilot's Licence with Instrument Rating. We have noticed that "Pilotage Standards", a compilation of the Association of British Aero Clubs and Centres, contains a syllabus for this course which has been accepted by the Ministry of Aviation, and against which establishments applying for approval are already being measured. We recommend that this might continue to be regarded as the minimum acceptable curriculum for the grant of official approval.

Standards of Accommodation and Equipment

These should cover:-

Accommodation, i.e. classroom size, lighting, ventilation, heating, etc.

Amenities required such as catering, rest rooms, libraries, sleeping accommodation.

Overall layout and appearance.

Educational equipment such as projectors, boards, etc.

To these the Ministry of Aviation should add more detailed specifications covering:-

Aircraft types and ancillary equipment.

Synthetic training equipment.

Aircraft maintenance arrangements, including hangarage.

Aerodrome requirements.

General Administration

Adequate records of training should be kept and such information furnished from time to time as the Minister of Aviation may require.

Staff

The qualifications of flying and ground instructors and consideration of adequate salaries are included in Chapter 15. We recommend that the level of salaries paid to instructors should be taken into account when approving courses. We have mentioned earlier that the needs of civil and service training have now diverged. Civil flying training still owes a considerable debt to service training methods and experience. Most of those engaged in instruction and administration at the schools we visited were service trained. In the future, we consider that for approval it would be desirable that the administration of courses should have a leavening of staff with civil aviation experience.

Such of the above standards as are relevant should also be applied to approved ground courses.

Numbers of approved courses

143. We were advised by the managements of two commercial training organisations that a commercially viable minimum number of students attending an integrated course of flying and ground instruction for the Commercial Pilot's Licence was about 40. On this basis, and including students from overseas who we hope will continue to be attracted to this country, there can scarcely be scope for more than four properly organised viable schools, including the College of Air Training. We consider that it is essential that the number of students at a course is sufficient to ensure efficient and economical operation and that the number of schools will therefore need to be limited strictly to the actual demand. Nevertheless we would not rule out any organisation from applying for approval if it thought it was commercially justified.

Chapter 14 - Costs

144. The view was expressed recently in the White Paper "Industrial Training: Government Proposals" that it is the responsibility of industry to carry the main share of the cost of industrial training. The White Paper "Aviation Safety" made it clear that the Government expects all operators to contribute towards the cost of training pilots. Any scheme for pilot training should be based on the principle that employers of pilots should contribute substantially to the cost. We noted that this principle is already accepted by the Airways Corporations, who carry a major portion of the cost of the College of Air Training, besides providing all the capital expenditure, and also by British United Airways, who pay the cost of training some pilots at Airwork Services Training, Perth. All airline operators carry the cost of continuation and conversion training for their own pilots. Many independent operators and other employers, however, contribute nothing towards the cost of initial pilot training.

145. We recommend that further Government assistance to pilot training should be administered in the form of financial assistance which might go either to the student pilot or alternatively by appropriate grants to an independent body or trust responsible for approved courses. We can of course see obvious objections to a grant going direct to a school run by a profit-making flying training or ground school. A further condition of a grant should be that it is only available for an approved course of professional pilot training and that the student must have met the selection requirements which we have described earlier in paragraph 104.

146. In the case of major operators we would expect, as at the College of Air Training, that the major costs of the student would be met by the prospective employer, who would also undertake to employ him at the end of training. The small independent operators, who do little or no initial training and who rely entirely on recruiting trained pilots, have only small demands for pilots and a system of direct sponsorship would be very difficult for them. The same consideration applies to firms employing executive pilots who might, as we have suggested earlier, become more numerous than at present. The answer to this problem probably lies in some arrangement on the lines suggested in the White Paper on industrial training, whereby funds would be raised for initial training with contributions from those operators who did not sponsor students on a scale commensurate with their size. We would hope that employers other than airlines would participate in any such scheme, possibly providing funds through their representative associations.

147. With regard to the amount of the Government grant we recommend that it would be appropriate for the grant to equal one quarter of the total cost of tuition, the greater part of which is the cost of flying. This formula was that originally agreed for the College of Air Training but the Government grant has been reduced by inflation and other factors from one quarter to one sixth. It is unlikely that more than about 100 such grants would be needed in any year in addition to those already made at the College. The size of the

grant in the case of the existing course at Airwork Services Training, Perth, would be about £700 per student. In addition, students would require about £400 a year for maintenance. The White Paper "Aviation Safety" refers to the fact that it would be open to local education authorities to make awards at all courses of pilot training, and we hope that, in the event of an approved national scheme of training being set up, these authorities would continue the policy already accepted in practice for students at the College of Air Training. As in the case of sponsored students elsewhere, airlines and other employers might maintain during training students they had selected.

148. In order to ensure that public money is not wasted on training pilots who cannot be absorbed by the industry, we consider that an essential condition to the award of a Government grant should be that the candidate is sponsored and his main costs met by a prospective employer in the United Kingdom.

149. We also considered whether all pilot training establishments should be run as educational trusts as is the College of Air Training. We noted that the profit-making training organisations are usually associated with a larger aviation interest, and although we see advantages in theory for training establishments being independently owned and administered, we feel that the wider aviation connection, with all that it could mean in the way of practical technical assistance, may well be of equal value.

Training for senior licences

150. We have referred in paragraphs 140 and 141 to the need for a further period of study, after adequate operational experience, before qualifying for an Airline Transport Pilot's Licence. Pilots on long distance flights may also be required by their employers to obtain a Flight Navigator's Licence. We were disturbed to find that many operators do not grant pilots studying for these senior licences and also type rating examinations, adequate paid leave to take the comprehensive courses which are available at the existing ground schools. This practice is contrary to good industrial training practice and condemns working pilots to the harassments of fitting study for these important qualifications into spells between duty and so intruding into the pattern of their domestic life, which we have observed elsewhere may not follow that of most other professions. We recommend strongly that adequate paid study leave should be granted for courses leading to senior qualifications and additional ratings.

Chapter 15 - Instructors

151. We considered earlier in paragraph 32 the work of the Guild of Air Pilots and Air Navigators' Panel of Examiners which administers the system of Instructor's Ratings. We learnt that the proposals to raise the standard of flying instruction mentioned in the White Paper "Aviation Safety" have been implemented. To secure better standardisation, the members of the Panel have met and flown with each other and compared notes on instructional and examining techniques. An Instructor's Rating could until recently be renewed on evidence of 50 hours of instructional flying in the immediately preceding 12 months. The requirement for renewal has now been changed and calls for a flying test every two years. In the first five months of these new tests, the failure rate was about 15%, thus showing that a proportion of instructors had failed to maintain the required standards. In addition, a number of instructors have allowed their ratings to lapse, but these lapsed ratings are to a great extent being replaced by new applications, with the result that the same approximate overall number of instructors - 476 on fixed-wing types and 35 on helicopters on the most recent count - is being maintained.

152. Some witnesses have criticised the system whereby the Guild examines for the Instructor's Rating on the Ministry of Aviation's behalf, mainly on the grounds that the Panel members exercise a loose control which leads to wide variations in standards, and have suggested that the Ministry should exercise direct control over Instructor's Ratings through the Inspectors of its Civil Aviation Flying Unit. We have examined the working of the Panel system and the recent reforms which have been introduced in co-operation with the Ministry, and we are satisfied that these have tightened the requirements sufficiently to avoid any dangers from lack of standardisation and to ensure that all holders of ratings are in good current practice. We noted that there are many precedents for the delegation of Ministerial responsibility in air safety matters to individual bodies and persons - for example, the delegation of instrument rating renewal tests to nominated pilots in operating companies, who are held responsible for checking out their own personnel. We could see no distinction in principle between the function of the Guild's Panel, and other delegated examiners: we recommend that in future such delegated authority be granted directly to the members of the Panel upon being nominated by the Guild. We concluded that the Guild's Panel conscientiously discharges its voluntarily undertaken task and there is at present no need to change this practice. If the Panel were abolished, the services of some of the most experienced examiners in the country would be lost and it should be remembered that the examiners are in fact practising instructors. Further, the Panel of Examiners operates most economically, and it is difficult to see how the tests could be administered centrally by the Ministry except at a much greater cost to candidates. In the present state of most flying clubs' finances and in view of the low salaries paid to most flying instructors such a move would have the most serious adverse effect.

153. At present an applicant for an Assistant Instructor's Rating is required to have "completed a flying instructor's course, the syllabus of

which has been approved and which has been conducted by an instructor approved to give instructor's courses". This requirement should be tightened and brought into line with the proposals for other approved courses of professional training. There could be no better place for these courses to be conducted than at establishments approved for Commercial Pilot's Licence courses. The two qualifications would in any case go well together and would not only further the standard of training of flying instructors but might also increase their numbers. We recommend that the syllabus for this course of training should be based on the Guild syllabus and that the members of the Guild's Panel of Examiners should conduct the final examinations.

154. The Ministry of Aviation does not grant approval to any course of pilot training unless at least the Chief Flying Instructor holds a Commercial Pilot's Licence and a full Instructor's Rating. The Ministry considers this to be sufficient for courses for the training of private pilots, but for the Commercial Pilot's Licence course it considers that in principle every flying instructor ought to hold not only a Commercial Pilot's Licence and a full Instructor's Rating, but also an Instrument Rating. We understand this standard has been achieved at the College of Air Training and to a large measure at Airwork Services Training, Perth. We agree with the Ministry's view but to make a firm requirement to this effect would at present be impracticable, for there are few pilots with these qualifications and they are very difficult to recruit to the schools. The reason for this lies in the scales of pay for flying instructors which apparently neither attract nor hold such pilots to this branch of the profession. The average salary of instructors ranges from about £700 a year for clubs to over £2,000 a year at the College of Air Training, an average for flying schools probably being about £1,400, although an instructor with an Instrument Rating and qualified on twin-engined aircraft would probably command about £1,800 a year. The attraction of the airlines themselves for men with such qualifications is obvious, either as airline pilots or for flying training of the more advanced types.

155. We hope that the proposals we have made for the approval and financial assistance of courses of professional pilot training will result in the establishment of a few efficient and commercially viable schools which will be able to offer reasonable salaries, pensions and conditions of service which will enable them to hold their instructors. The need to improve instructors' salaries is generally recognised. We recommended earlier that one of the factors to be taken into account by the Ministry of Aviation when granting approval should be the levels of salaries paid to both ground and flying instructors. We also recommend that instructors, as professional pilots, should be eligible for Government and local authority grants for their training, subject to the conditions governing awards recommended in Chapter 14.

156. No qualifications have hitherto been set in this country for ground instructors. Their numbers are small and most of them have been drawn until recently from the Services, from ex-mariners with war-time flying experience, or from former holders of Flight Navigator's Licences.

Ideally, good ground instructors should have not only some practical aviation experience, but also suitable training in lecturing and teaching techniques, e.g. at a technical teacher training college. Ground instructors are less well paid than flying instructors. If better salaries could be offered, operationally experienced aircrew who have lost their licences prematurely might be attracted to ground instruction. Although it is desirable for ground instructors to have had practical civil aviation experience, we consider that it would be impossible, in view of the recruitment difficulties, to require this as a standard; we hope, however, that at all courses approved by the Ministry at least the Chief Ground Instructor would have had experience of commercial aviation.

157. An essential feature of courses for the Commercial Pilot's Licence or Instrument Rating is ground instruction in instrument flying and airways procedures on simulated flight trainers. The number of instructors who supervise training on these machines is again very small. Lecturing and teaching ability is not essential for simulator instructors but like ground instructors they require a sound background of practical aviation experience, especially in navigation and airways procedures. Qualifications for instructors on more advanced simulators, which reproduce in detail the flight characteristics of various aircraft types, have much in common with those of flying instructors and we suggest that this field is one particularly suitable for former pilots.

PART IV

CONCLUSION

Chapter 16 - General conclusions

158. It became very clear soon after we began our task that owing to changes in both military and civil requirements, civil aviation could no longer look to the Services for young, well-trained and experienced pilots. It follows inevitably that civil aviation must in the future stand on its own feet in the matter of recruitment and training. We could not accept that in this matter civil aviation requires special consideration. Pilot training is expensive, but it is not much more so than the cost of training student technologists in industry. Like the major airline operators, smaller organisations employing pilots must realise that it is in their long-term interests in terms of safety and efficiency to initiate, individually or collectively, planned and soundly based schemes of entry and training for pilots. The planning of recruitment will be especially important if the forthcoming retirement "bulges" which we have noted are to be successfully smoothed out.

159. Our suggestions for partnership with the Government and local education authorities in sharing costs and for the approval of courses are in line with arrangements for other schemes of vocational training.

160. Necessarily, we have had to concentrate on broad principles rather than on specific details for the training arrangements we have in mind. These must inevitably be left to the relevant Ministries and interested organisations. If the broad concepts we have recommended are to be implemented, then there is need to provide for flexibility, so that provision is made for the exceptional candidate mentioned in paragraph 127 to become a professional pilot. The pilot body would benefit from the resultant diversity of talent and experience. We attach particular importance to the need to attract graduates and to devise a suitable course which takes into account their special qualifications and abilities.

161. We came very definitely to the opinion that there is a pressing need for a scheme on the lines of the "Junior Wings" scheme which we have recommended. Inevitably in future the main source of recruitment for professional pilots will be from among school-leavers, especially those in the Sixth Forms. British civil aviation at the moment suffers from the comparative weakness of its private and general aviation, despite the enthusiastic efforts of clubs and groups throughout the country. This results in their being very little opportunity, compared with countries abroad where this form of aviation flourishes, for young persons at school to have some contact, however small, with aviation. This situation in our view is likely to hamper seriously the efforts of sponsors to attract and recruit the right calibre of young person in competition with other industries. The numbers required for entry into professional flying are comparatively small and a scheme on the lines suggested would be an effective and economical method of recruitment.

162. Finally, the future pattern of pilot training must be kept flexible, if the rapidly changing needs of aviation are to be met in an adequate manner. When the inevitable changes in policy are introduced, care is needed to avoid unduly violent disturbance to the running of the established training schools, which have so far had to operate under somewhat difficult conditions of financial stringency.

Chapter 17 - Summary of main conclusions and recommendations

Our main conclusions and recommendations are as follows:-

Estimated future requirements

163. (1) The requirements of civil aviation and the Services have now diverged. (paragraph 89)

(2) In the future entry from the Royal Air Force at the "38/16" point will be difficult and unattractive and unless Royal Air Force recruitment policy changes, the Service cannot be a reliable source of recruitment for civil aviation in the future. (paragraph 90)

(3) For the immediate future such Short-Service Commission pilots as become available will still provide a possible source of recruitment; until the full effect of the "38/16" policy is experienced. (paragraph 91)

(4) The licensing requirements for ex-Service pilots are reasonably applied and no major changes are needed in this area. (paragraph 91)

(5) For the immediate future there is little prospect of a shortage of professional pilots. (paragraph 92)

(6) A long-term estimate of a future annual requirement for 200 new professional pilots is sound. (paragraphs 94 and 95)

(7) The most likely field of significant growth in requirements for professional pilots in the future is general and executive aviation. (paragraph 96)

(8) To accommodate overseas students civil pilot training facilities in this country should be capable overall of training 250 professional pilots a year. (paragraph 97)

(9) The imbalance in the age structure of the professional pilot body will require a planned programme of recruitment to avoid large fluctuations in the demand placed on training establishments. (paragraph 98)

(10) Central planning machinery is required for this purpose but employers of pilots must accept their responsibility, as do other employers, for planning forward recruitment. (paragraph 98)

(11) The Ministry of Aviation should co-ordinate through the Standing Joint Committee on Recruitment to Civil Aviation from the Services, all operators' forecasts of future requirements;

forecasts for only two years ahead are inadequate and the Standing Joint Committee should issue estimates for at least five years ahead. (paragraph 98)

(12) The title of the Standing Joint Committee should be amended. (paragraph 99)

Selection and recruitment

164. (13) In future civil aviation will inevitably have to look for most of its recruits from amongst young people in the Sixth Forms, studying to Advanced level. (paragraph 100)

(14) If opportunities are not available to young people in Sixth Forms to develop their enthusiasm and interest in flying most of them will pursue other careers; for the small numbers required, the methods of recruitment employed in other fields would be extremely expensive and uneconomic for civil aviation. (paragraph 101)

(15) A "Junior Wings" scheme should be introduced as a more satisfactory and economical method of recruitment and selection for civil pilots. (paragraphs 102 and 103)

(16) The basic requirements for selection for pilot training are a standard of academic attainment, physical fitness and proven ability to "go solo". (paragraph 104)

(17) Proper initial selection will be essential in any scheme of professional pilot training; selection procedures could be suitably shortened for those who had demonstrated their suitability through the "Junior Wings" scheme. (paragraph 104)

(18) The chief deterrents to recruitment are the lack of a well-defined method of entry and training, the relatively early retirement age, the risk of unexpected premature retirement, and the relatively poor promotion prospects. (paragraph 107)

(19) The loss to aviation of the expensive training and valuable experience of mature pilots, either on normal or premature retirement, should not be accepted unquestioningly; consideration should be given by employers and representatives of pilots to ways of providing for the reabsorption of retired pilots within the aviation industry, and opportunities should be provided for such pilots to adapt themselves by further training for other walks of life. (paragraph 110)

(20) Prospects of new entrants to the Airways Corporations of achieving command at a reasonably early age are extremely remote, even for the most able. (paragraph 112)

(21) In independent airlines the problem of promotion is slightly less acute. (paragraph 113)

(22) The long spell of co-pilot service which at present faces new recruits, especially in the Airways Corporations, will tend to stultify interest, initiative, and enthusiasm for flying and may constitute a positive deterrent to the recruitment of good material. (paragraph 114)

(23) Operators and pilots should review present promotion policies and consider the introduction of less rigid practices. (paragraph 114)

(24) Although the number of women wishing to apply for professional pilot training is likely to be small in the foreseeable future, nothing should be done to inhibit recruitment and suitable arrangements for their training should be kept available within the future framework. (paragraph 117)

Principles of training

165. (25) There is a need for diversity in the non-flying qualifications of pilots; any attempt to impose too uniform a standard must lead to future difficulties. (paragraph 118)

(26) Research should be undertaken into the correlation between initial training standards and the safety standards of public transport; in particular training records should be maintained throughout the working life of professional pilots. (paragraph 119)

(27) Despite the absence of firm evidence to support the assumption that there is a strong link between initial training standards and safety, proper basic training, especially in flying training, is desirable as a sound foundation. (paragraph 122)

(28) If the professional pilot body is to achieve appropriate status it must have well-defined methods of entry and training. (paragraph 122)

(29) The piecemeal training of professional pilots is to be deprecated and as a general principle the concept of approved courses as the future training pattern is supported. (paragraph 123)

(30) The minimum course of training for professional pilots need only be sufficient to cover the requirement for adequate preparation for the examination syllabus laid down for the Commercial Pilot's Licence and Instrument Rating. (paragraph 125)

(31) Ground and flying instruction should follow a logical sequence; courses which do this should continue to qualify for a reduction in the number of flying hours required for the Commercial Pilot's Licence. (paragraph 125)

(32) Instruction at geographically separated ground and flying schools is acceptable, subject to certain conditions, but such instruction should not qualify for a reduction in the flying hours required. (paragraph 125)

(33) A requirement should be introduced that all applicants for the Commercial Pilot's Licence should have obtained a G.C.E. with five Ordinary level passes, including mathematics, English and a relevant science subject. (paragraph 126)

(34) The educational requirement should be kept under review to see whether two Advanced level passes should be made mandatory at a later date. (paragraph 126)

(35) The approved minimum course should have sufficient flexibility to enable experienced persons to be fitted in at an appropriate point according to their age and qualifications; any new licence requirements and conditions for approved courses should include appropriate exemptions for such people. (paragraph 127)

(36) The case of certain graduates in relevant subjects who wish to become pilots should receive very careful consideration. (paragraph 128)

(37) Consideration should be given to the establishment of a suitable course of pilot training for graduates at the College of Aeronautics, Cranfield. (paragraph 129)

(38) Although the numbers following special courses would be very small, the professional pilot body needs as much diversity as it can get. (paragraph 130)

(39) It would be desirable for courses to include a broad treatment of technical subjects and a certain amount of English and general studies. (paragraph 131)

(40) The desirability of widely based courses may inevitably have to be tempered by economic and other considerations, but in time such courses may well become essential. (paragraph 132)

(41) The addition of further studies to the minimum approved course would need careful arrangement and it would be advantageous if such studies could be undertaken at, or in association with, an

educational establishment providing advanced courses. (paragraph 133)

(42) The College of Air Training's liberal approach to training is valuable, although it is at a higher level, and more costly, than the minimum standard required. (paragraph 138)

(43) The present arrangements at the College of Air Training for the training of graduates are open to objection; the need for a growing emphasis on the importance of commercial aviation experience amongst the staff, particularly the senior members, should also be kept in mind. (paragraph 138)

(44) Despite criticisms, which are to be expected at this stage, the College is already performing a useful function; it can be anticipated that the Governing Body will give it their particular care and attention until it is established at the very high level intended by its sponsors. (paragraph 138)

(45) There are several serious objections to a requirement which the Ministry of Aviation has been considering for a "junior" Airline Transport Pilot's Licence for all co-pilots of public transport aircraft. (paragraphs 139 and 140)

(46) Whatever the extent and scope of the initial course of training, young pilots need to return at the appropriate point in their careers for tuition for the Airline Transport Pilot's Licence. (paragraph 141)

Approval of courses

166. (47) The Ministry of Aviation should be responsible for working out detailed standards of approval and for inspecting and approving courses, in association with the education departments; the advice of interested organisations should also be sought, perhaps through a joint committee. (paragraph 142)

(48) As soon as any decision to introduce a system of approval is taken, the relevant standards should be worked out and properly published in detailed form at the earliest opportunity. (paragraph 142)

(49) Some matters which ought to be covered in standards of approval are suggested. (paragraph 142)

(50) Ground schools should also be approved. (paragraph 142)

(51) It is essential that the number of students at courses is sufficient to ensure efficient and economical operation and the number of schools will need to be limited to the actual demand; there can

scarcely be scope for more than four properly organised viable schools, including the College of Air Training. (paragraph 143)

Costs

167. (52) Any scheme for pilot training should be based on the principle that employers of pilots should contribute substantially to the cost. (paragraph 144)

(53) Further Government financial assistance to pilot training might go either to the student pilot or alternatively by grants to an independent body or trust; there would be obvious objections to grants going direct to profit-making flying or ground schools. (paragraph 145)

(54) Government assistance should only be available to suitable students at approved courses. (paragraph 145)

(55) Major operators would probably adopt a system of direct sponsorship, as at the College of Air Training; minor operators and other organisations employing small numbers might find direct sponsorship difficult and the answer to this probably lies in some appropriate collective scheme. (paragraph 146)

(56) It would be appropriate for the Government grant to equal about a quarter of the total cost of tuition; it is unlikely that more than about 100 such grants would be needed in any year in addition to those already available at the College of Air Training. (paragraph 147)

(57) In addition, students will require assistance towards maintenance and it is hoped that local education authorities will make awards; sponsoring employers might maintain students during training. (paragraph 147)

(58) An essential condition to the award of a Government grant should be that the candidate is sponsored and his main costs met by a prospective employer in the United Kingdom. (paragraph 148)

(59) Although there are advantages in theory for training establishments to be independently owned and administered, a wider aviation connection may well be of equal value. (paragraph 149)

(60) Adequate paid study leave should be granted for courses leading to senior qualifications and additional ratings. (paragraph 150)

Instructors

168. (61) Recent reforms to the working of the system of Instructor's Ratings have tightened the requirements sufficiently to avoid any

dangers from lack of standardisation and to ensure all holders of ratings are in good current practice. (paragraph 152)

(62) In future delegated authority should be granted direct to the Members of the Panel of Examiners upon being nominated by the Guild of Air Pilots and Navigators. (paragraph 152)

(63) The Guild's Panel conscientiously discharges its voluntarily undertaken task and there is no need to change this practice, which has several positive advantages. (paragraph 152)

(64) The present training requirement for an Assistant Flying Instructor's Rating should be tightened by bringing it into line with the recommended proposals for other approved courses of professional training. (paragraph 153)

(65) The syllabus for a flying instructor's course should be based on the Guild syllabus and the members of the Panel of Examiners should conduct final examinations. (paragraph 153)

(66) For the Commercial Pilot's Licence, every flying instructor ought in principle to hold not only a Commercial Pilot's Licence and a full Instructor's Rating, but also an Instrument Rating; a firm requirement to this affect however, would at present be impracticable because there are few pilots with these qualifications and they are difficult to recruit to the schools. (paragraph 154)

(67) There is a need to improve instructors' salaries and the level of these should be taken into account when granting approval. (paragraph 155)

(68) Instructors should be eligible for the award of training grants. (paragraph 155)

(69) The main desirable qualification for ground instructors is practical civil aviation experience but it would be impossible to require this as a standard in view of recruitment difficulties; it is hoped that at all courses approved by the Ministry at least the Chief Ground Instructor would have had such experience. (paragraph 156)

(70) Better salaries might attract operationally experienced aircrew, who have lost their licences, to ground instruction. (paragraph 156)

(71) Simulator instructors too require a sound background of practical aviation experience; instruction on advanced simulators is a field particularly suitable for former pilots. (paragraph 157)

Chapter 18 - Acknowledgments

169. We are indebted to the many organisations and persons listed in Appendix I who have presented evidence to us. In many cases they gave us the benefit of oral evidence as well as written memoranda and information. We were impressed by the amount of time and trouble which they must have taken in preparing and submitting their views and in promptly answering the many further queries which we often put to them. The evidence resulting from their efforts has been of the greatest assistance to us.

170. We also visited training establishments and we are extremely grateful to their managements, staffs and students for the help and hospitality which they so readily afforded.

171. Our gratitude is especially due to the Administrator of the Federal Aviation Agency, Washington, Mr. Halaby, and his staff, for the whole-hearted co-operation and assistance given to our Chairman and Mr. Neill during their visit to the United States. Thanks to the efforts of Mr. Hammee and Mr. Schall of the Agency, and to the kind loan of the Administrator's personal aircraft, a crowded programme was completed smoothly and without a hitch. The hospitality shown by the organisations visited was throughout in the traditional American manner and was marked by innumerable instances of spontaneous and kindly help.

172. We desire to express our thanks to the Assessors, Mrs. Alston and Mr. Neill; their expert advice has been of great help to us. To our Secretary, Mr. Northrop, we are indebted for enthusiastic and devoted service, not only in obtaining much of the evidence, but also in the administrative arrangements for meetings and visits, and especially for his skill in helping to give order and shape to the Report.

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June, 1963.

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Lennoxlove,
Haddington,
East Lothian.
29th June, 1963.

The Rt. Hon. Julian Amery, M.P.,
Minister of Aviation.

My dear Amery,

I am pleased to submit the Report of the Committee which was set up by your predecessor in July, 1962, under my Chairmanship, to enquire into the training and education of pilots for civil aviation.

Yours sincerely,

Hamilton.

REPORT

OF

THE COMMITTEE ON PILOT TRAINING

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